TECHNOLOGY DEPT.

Plastics

DEALING WITH THE MANUFACTURE, USES AND POTENTIALITIES OF PLASTIC MATERIALS

taken

at

random

Take the pens, for instance: they're good to handle — and even a schoolboy would find them hard to break. Cellulose acetate is tough.

Take the table lighter: a luxury article. Cellulose acetate — unlike so many other plastics — is unaffected by petrol; and what plastic has a finish more luxurious?

Take the miniature oiling pen: cellulose acetate's clean transparency and imperviousness to oil puts a good idea into its most practical form.

Take the globe and its stand (all cellulose acetate): put your finger on any region, and it's more than likely that they're using products made with Courtaulds' cellulose acetate moulding powders.

Courtaulds

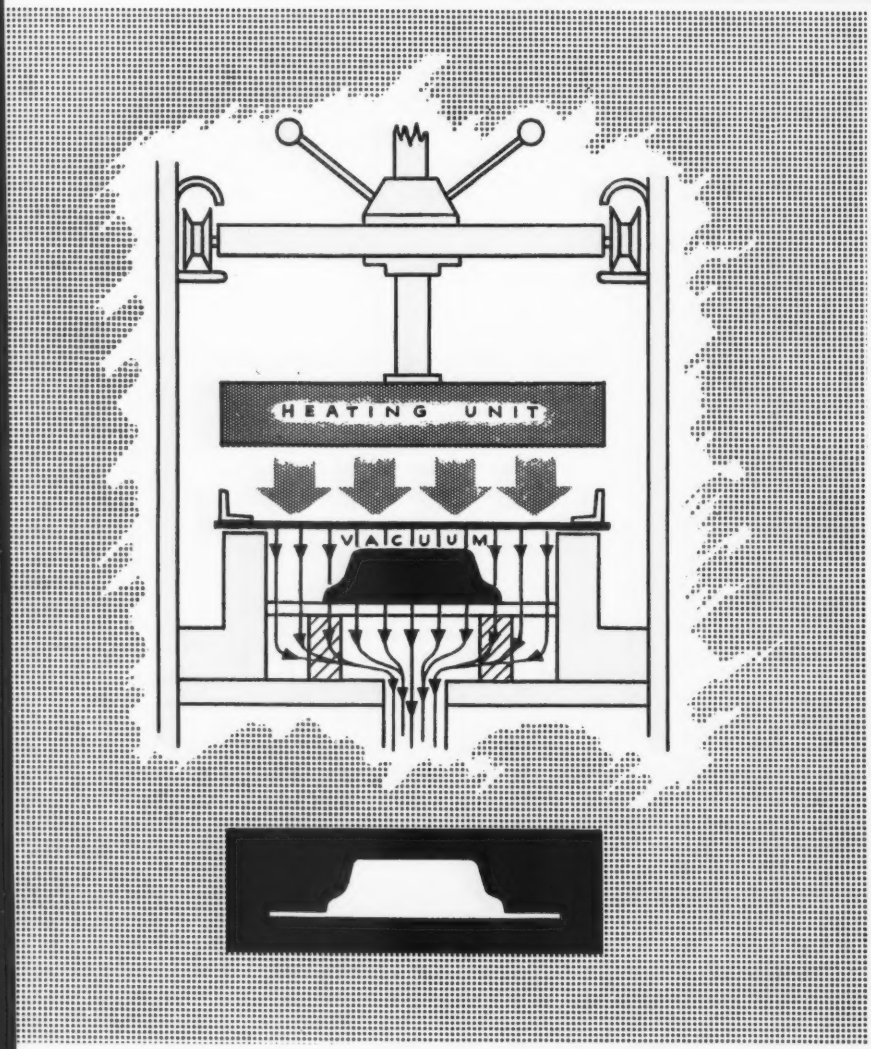
cellulose acetate moulding powders

Courtaulds' Technical Service
welcome your enquiries about any aspect of plastics.
Plastics Division: Little Heath, Coventry
Telephone: Coventry 88031.
16 St. Martin's-le-Grand, London, E.C.1.
Telephone: Monarch 8811.

extremely tough
and durable
unlimited colours
not brittle
no fire risks
clean contours

VACUUM FORMING

THE BEST MATERIALS



COBEX Regd

BEXTRENE Regd.

BEXOID Regd.

BEXOID FILM

Write for folder describing full range of BX products.

BX PLASTICS LIMITED

HIGHAM STATION AVENUE · LONDON · E4

All New HPM

THE WORLD'S *MOST COMPLETE LINE* OF PLASTICS INJECTION MACHINES!

STANDARD INJECTION MACHINES

MODEL NUMBER	150-H-6	300-H-12	400-H-20	800-H-48
Capacity (oz.–Single Feed)	6	12	20	48
Capacity (oz.–Double Feed)	8	16	28	64
Material Injected (cu. in. per min.)	440	1035	1330	2895
Plasticizing Capacity (lbs. per hour)	60	100	135	350
Mould Clamp Capacity (tons)	150	300	400	800
Mould Space (hor. × vert.):				
(*a*) Full Platen Vert.	10½″ × 25″	16½″ × 33″	20½″ × 42″	36″ × 54″
(*b*) Full Platen Hor.	20½″ × 15″	30″ × 20″	36″ × 26½″	54″ × 36″
Daylight Opening without Ram Spacer	20″	30″	40″	55″
Daylight Opening with Ram Spacer	16″	26″	34″	47″
Mould Thickness without Ram Spacer	10″	10″	15″	20″
Mould Thickness with Ram Spacer	6″	6″	9″	12″
Clamp Travel (max.)	10″	20″	25″	35″
Motor Horse-power	20	40	50	100
Shipping Weight (pounds)	14500	22000	39000	75000

NOTE: All ratings based on moulding general purpose polystyrene

Other H.P.M. Models are available with these capacities:—

STANDARD
Model 600-H-32 Capacity 32 ounces.
,, 1200-H-80 ,, 80/100 ,,

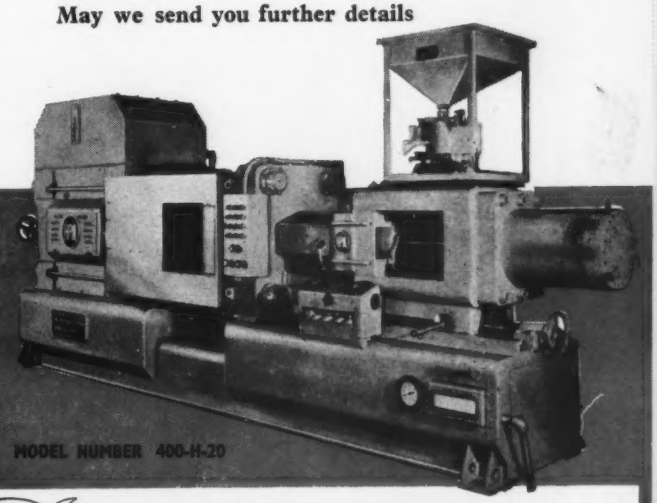
PRE-PLASTICIZING
Model 400-P48A Capacity 48 ounces.
,, 1200-P200 ,, 200 ,,
,, 3000-P400A ,, 400 ,,

From 6 ounces to 400 ounces; with mould clamping pressures from 150 tons to 3,000 tons . . . that's the scope of the new H.P.M. range.

Each machine is new, designed with many outstanding features. High capacity plasticizing chambers, weigh feeders, greater 'shot' capacities, increased daylight and stroke, quiet pumps, and sub-plate mounted valves reducing piping to the absolute minimum, are some of the reasons why H.P.M.'s mould better, faster and at lower cost.

They are famous for dependability too; designed by America's pioneer manufacturers of injection machines, each unit has 77 years' hydraulic machinery building experience behind it.

May we send you further details



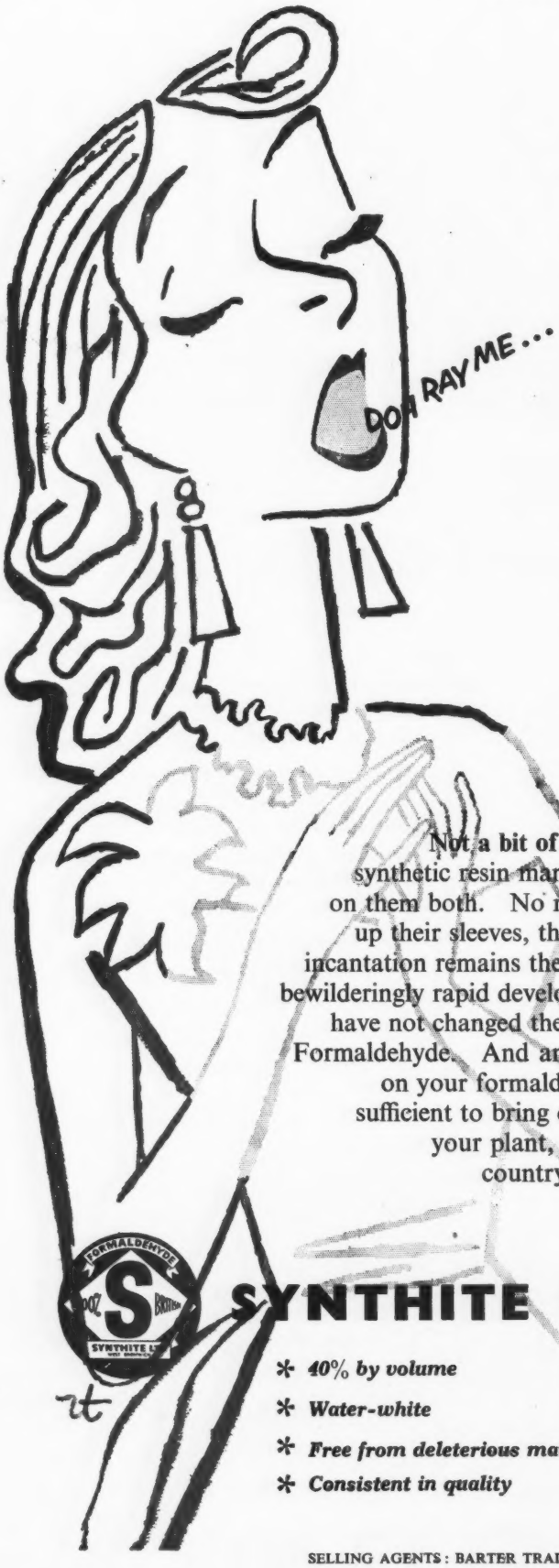
MODEL NUMBER 400-H-20

WICKMAN LIMITED

FACTORED MACHINE DIVISION, FLETCHAMSTEAD HIGHWAY, COVENTRY

Telephone: Coventry 40351

492 P45



Bit of a far cry from the tonic solfa to Synthite Formaldehyde,

Isn't it?

Not a bit of it! Whether you're a soprano or a synthetic resin manufacturer you can always rely on them both. No matter what the modern composers have up their sleeves, the familiar "doh, ray, me, fah" incantation remains the same. Similarly, thirty years of bewilderingly rapid development in the synthetic resin industry have not changed the constant uniformity of Synthite Formaldehyde. And another thing; you can always rely implicitly on your formaldehyde deliveries. A telephone call is sufficient to bring our fast tankers speeding towards your plant, no matter what part of the country it may be.

SYNTHITE FORMALDEHYDE

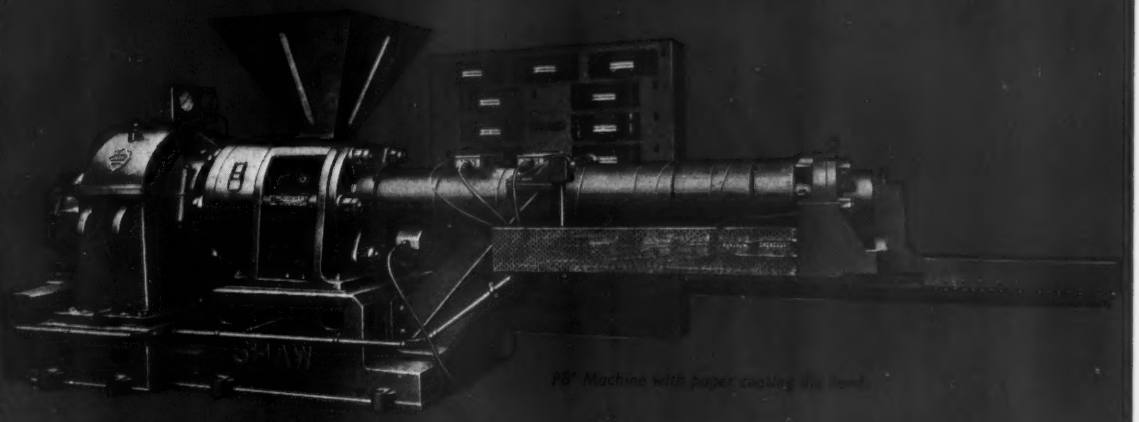
* ***40% by volume***
* ***Water-white***
* ***Free from deleterious matter***
* ***Consistent in quality***

Manufactured by
Synthite Ltd.,
West Bromwich, Staffs.

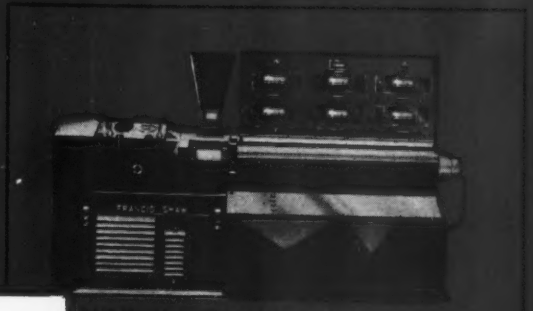
A member of
the Tennant Group of Companies.

SELLING AGENTS: BARTER TRADING CORPORATION, 14 WATERLOO PLACE, LONDON, S.W.1

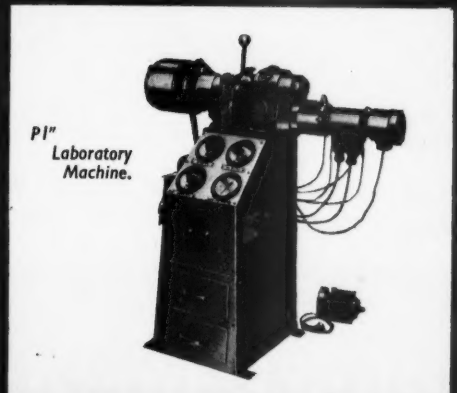
Leaders in Extruder design and manufacture since 1879



P8" Machine with paper cooling the hose.



4½" Machine with straight on head.



P1" Laboratory Machine.

RUBBER & PLASTIC EXTRUDERS

SHAW

Pioneers in the design and development of machinery for the Rubber and Plastics Industries, Shaw have consistently produced better and more efficient machines. This tradition of pioneering spirit by the Shaw team of Plastic Extruder-specialists specially designed for the combination, fast speed production of tubing, rubber and plastic-covered sections. Fitted with a cross-head, they are ideal units for cable sheathing processes. Strength and reliability, combined with carefully designed heating elements, efficient electric heating and temperature control, have made these machines an outstanding success in all branches of the Industry.

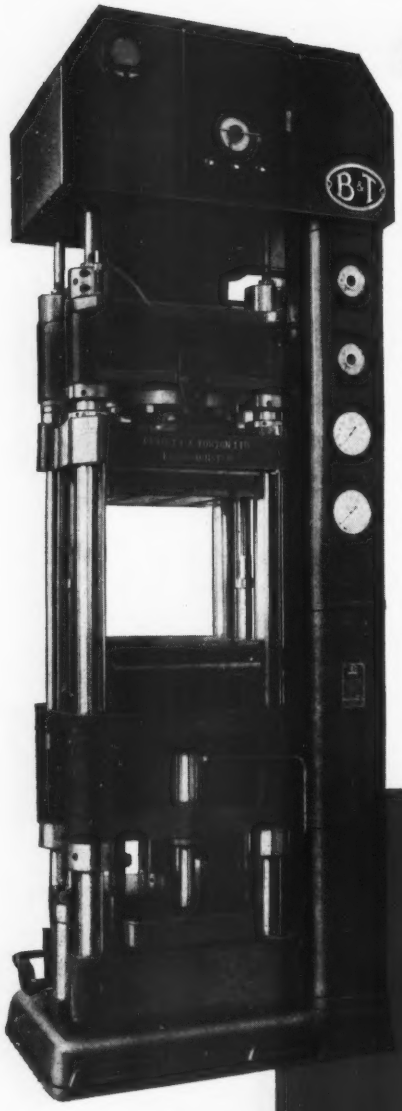
FRANCIS SHAW & COMPANY LIMITED MANCHESTER 11 ENGLAND

TELEPHONE: EAST 1415/8 TELEGRAMS: CALENDER MANCHESTER

'536'

UNIVERSAL MOULDING PRESS

. . . with push-button automatic control!



Here in one compact self-contained unit is a new advance in precision engineered, auto-controlled moulding presses. The '536' repeats any thermosetting moulding cycle, transfer or compression, including "breathing" and "dwell"—automatically. The operator simply loads the powder and presses a button.

The '536' Type U/1 is fitted with its own motor driven pump unit and only requires the electrical connections to be made for starting up.

It can also be supplied to operate from an accumulator supply.

Changeover from one moulding cycle to another is simplicity itself and can be accomplished in minutes!

Hand operation is provided for tool setting and short run production.

Full details are available upon request. Please ask for leaflet No. 47/23.

Bradley & Turton Ltd

CALDWALL WORKS, KIDDERMINSTER

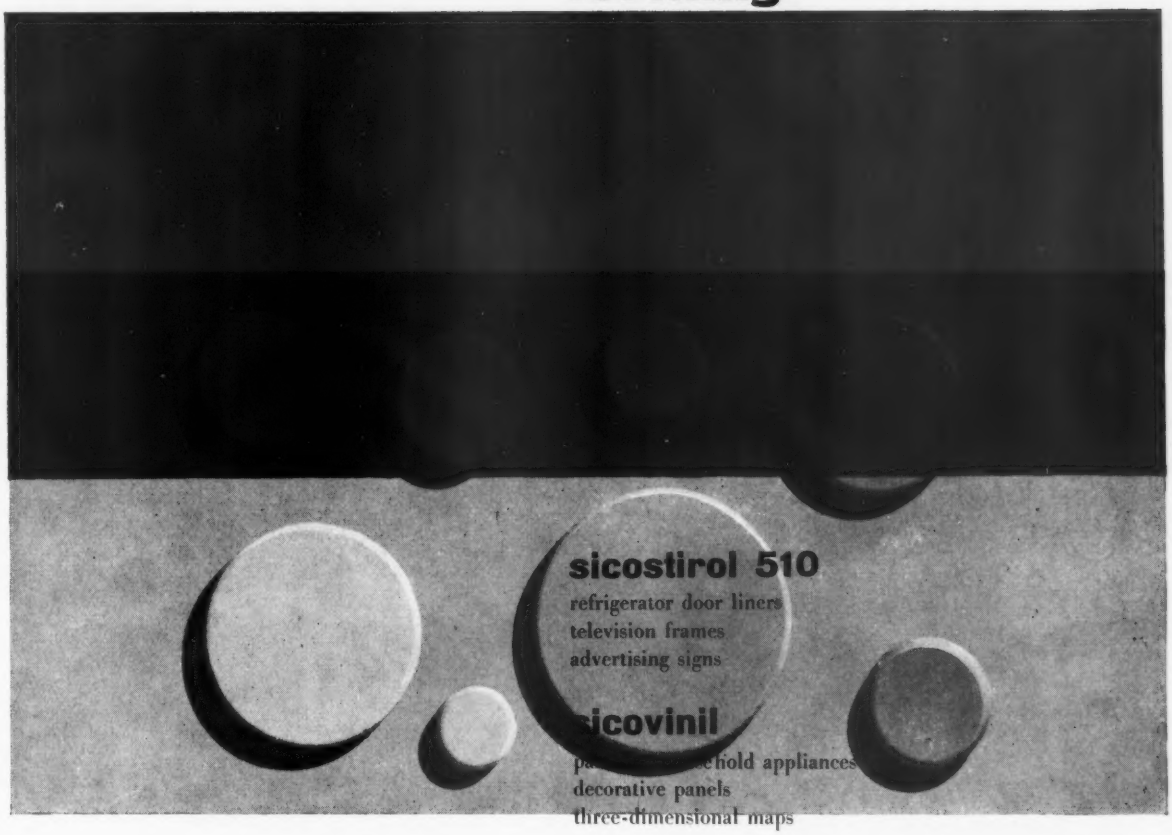
Telephone: 2217/8

Birmingham Office:

13, Soho Road, Handsworth, Birmingham 21 Telephone: Northern 2519

THE LEADING MANUFACTURERS OF COMPRESSION MOULDING EQUIPMENT

Thermoplastic materials for vacuum forming



sicostirol 510
refrigerator door liners
television frames
advertising signs

sicovinil
household appliances
decorative panels
three-dimensional maps

sicalene
industrial & domestic containers

sicoform
toys
packagings
luminous signs

many sizes & thicknesses available

ask for our vacuum forming booklet

sic
Società Italiana Celluloide Castiglione Olona (Varese) Italy

S.I.C. Plastics Ltd. (Sole U.K. Concessionaires for Soc. Italiana Celluloide.)
12 Whitehall, London, S.W.1 *Telephone:* Trafalgar 7337

IT'S PART OF *Sterling* SERVICE

STERNITE
Phenolic Moulding Powder

FOR COMPRESSION & TRANSFER MOULDING

General purpose Grades:
(Types G and GX) conforming to B.S.S. 771

All of exceptional quality for their particular applications and in a range from which it is possible to meet any specification with absolute confidence.

Other Grades available include:

Shock resisting	Heat resisting
Water resisting	Acid resisting
High dielectric	Cabinet
Telephone Grade 1	Odourless, etc. etc.

"Pour it down the telephone"—catch phrase with Sterling for supplies that are wanted absolutely right away. When we put "P.D.T." on an order, the staff knows what *that* means. We pride ourselves that customers get what they want, when they want it, frequently sooner—and at a price they cannot better anywhere else.

All other things being equal, a customer goes to the supplier who gives the closest attention to his individual requirements. The "other things" of course are of vital importance: quality, uniformity of product and first-rate technical assistance. Suffice it to say that Sterling supply their STERNITE moulding powders to the leading moulders in this country and in many others overseas. May one of our technical salesmen call upon you "P.D.T."?

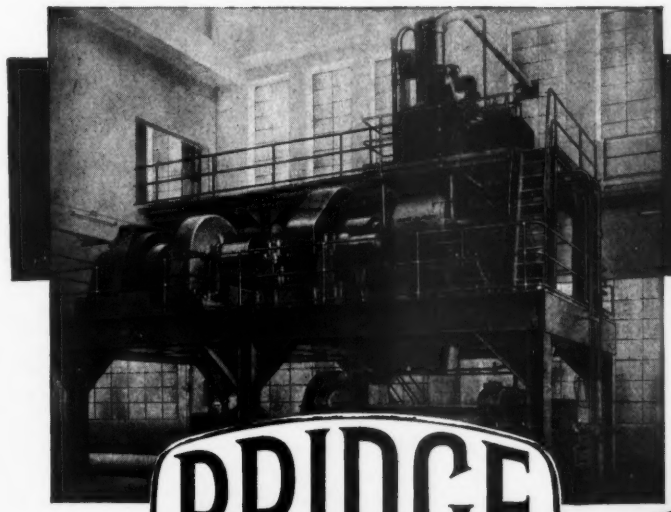
Members

S.13

Sterling Moulding Materials Ltd.

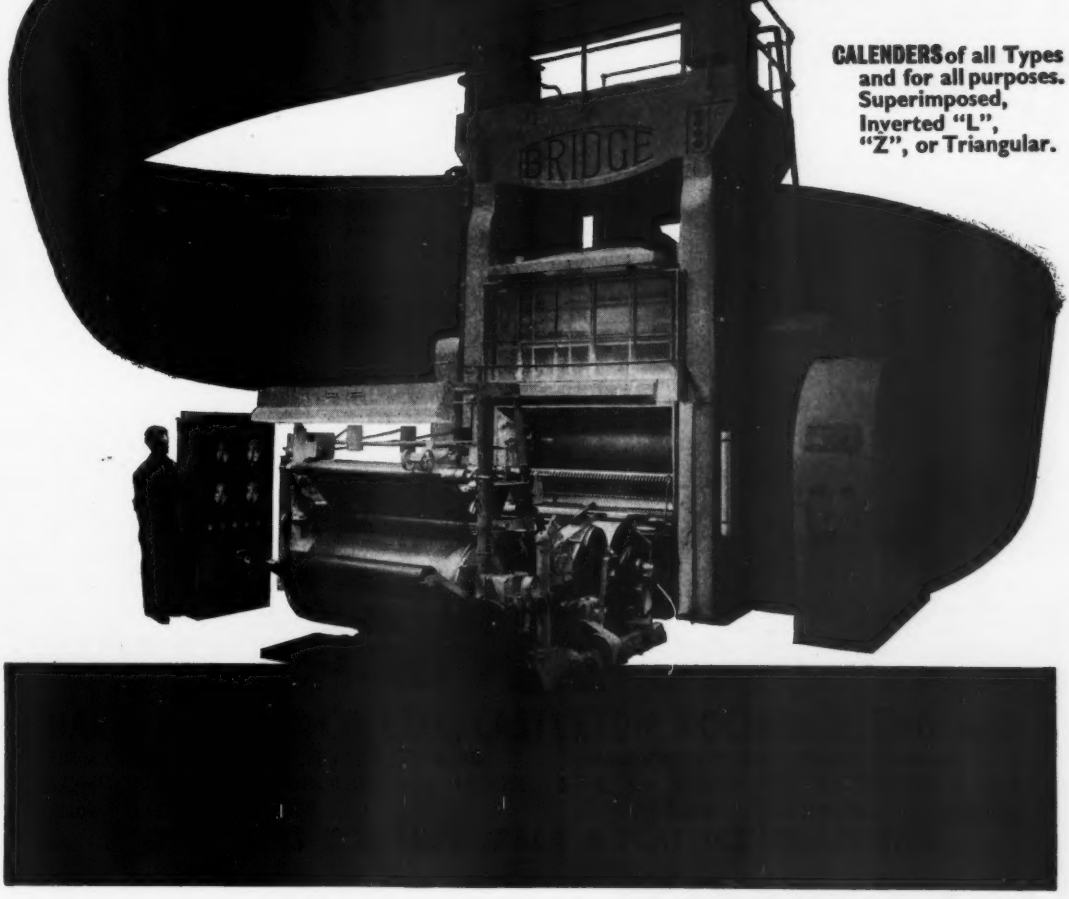
STERLING HOUSE, HEDDON STREET, LONDON, W.1. *Works: Stalybridge, Cheshire.*

Phone: Grosvenor 5301/10. Grams: Stermold, Piccy, London. Cables: Stermold, London.



dard for
efficiency compo

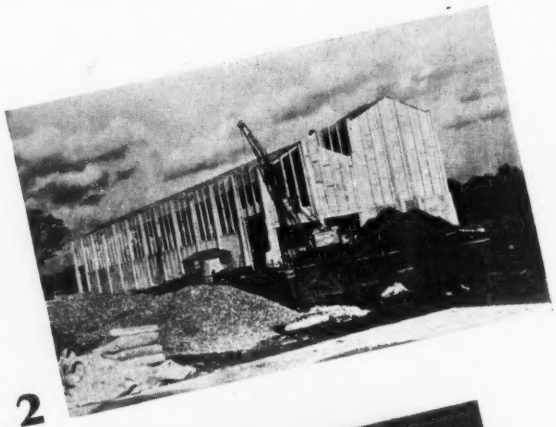
BRIDGE



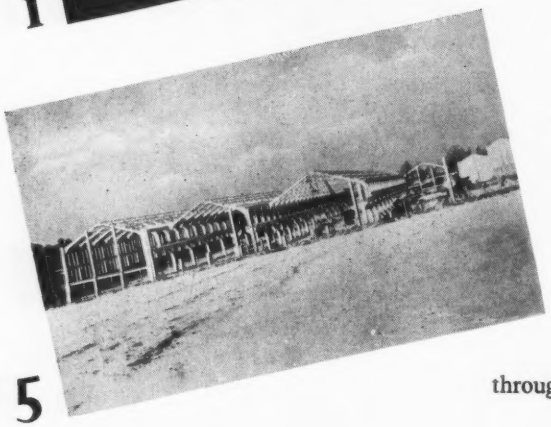
CALENDERS of all Types and for all purposes. Superimposed, Inverted "L", "Z", or Triangular.

12 months ago a GUARANTEE was given by Beecham Buildings Ltd., to complete a new factory of 200,000 sq. ft. for Sterling Metals Ltd., of Nuneaton within a year. This factory is now ready for production.

1



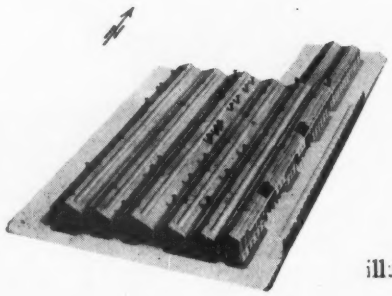
2

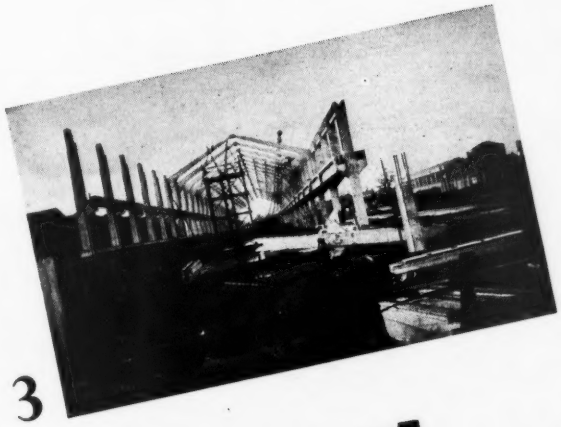


5

6

Completed on time, this contract was carried through a winter which is memorable for its severity. One of the worst continuous twelve months of weather since Meteorological records have been kept failed to interrupt the daily production of concrete components at the Beecham Works and their erection on the site. This new factory is standing proof of the value of Beecham's guarantee, proof that Beecham's new ways of building produce the speed, economy and results that are necessary in modern industry. This is the largest permanent prefabricated concrete building in Great Britain. The model illustrated on the left was used to pinpoint progress on this contract.



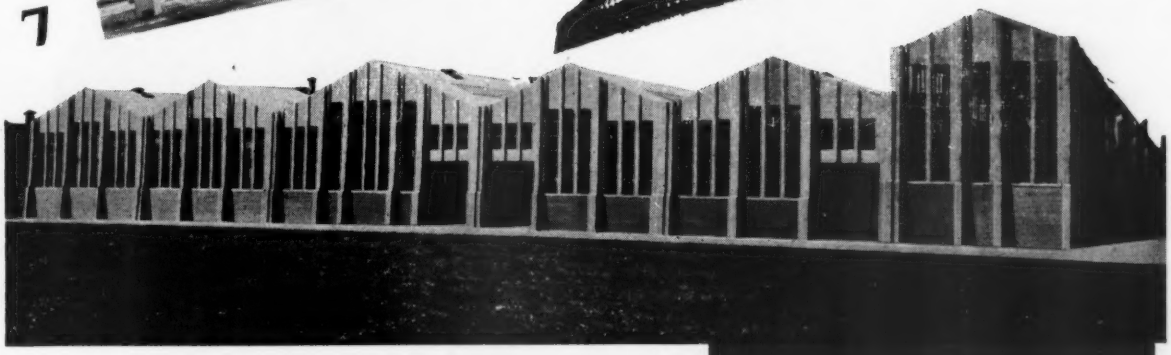


3

4

7

A Guarantee honoured!



* *May we advise you on the construction of permanent and competitive Industrial buildings?*

BEECHAM BUILDINGS LIMITED

DEPT. K. SHIPSTON-ON-STOUR, WARWICKSHIRE. Telephone: Shipston-on-Stour 315, 316, 3287.

Beecham Buildings

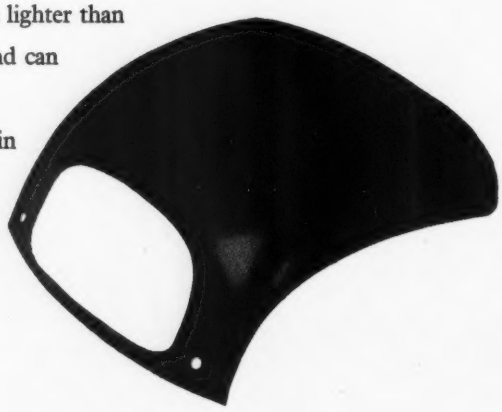
AP.2113.47

Rear wings and radiator panel (right) moulded from Polyester/Glass-Fibre by Rochdale Motor Panels and Engineering, for Sharps Commercials Limited, makers of the Bond Minicar.

BAKELITE *Polyester* Resins in the BOND MINICAR

The radiator panel and rear wings of the shapely, re-designed Bond Minicar are now moulded from BAKELITE Polyester Resins with glass fibre reinforcement. These tough mouldings bring the car owner many benefits.

They have high impact strength yet are lighter than metal panelling. They will not rust or corrode, and can be repaired easily, quickly and inexpensively, should the need arise. BAKELITE Polyester Resins are already used in moulding complete car bodies, boat hulls, press tools and special aircraft parts. Simple to produce, these strong, light mouldings may be self-coloured or sprayed in the usual way.



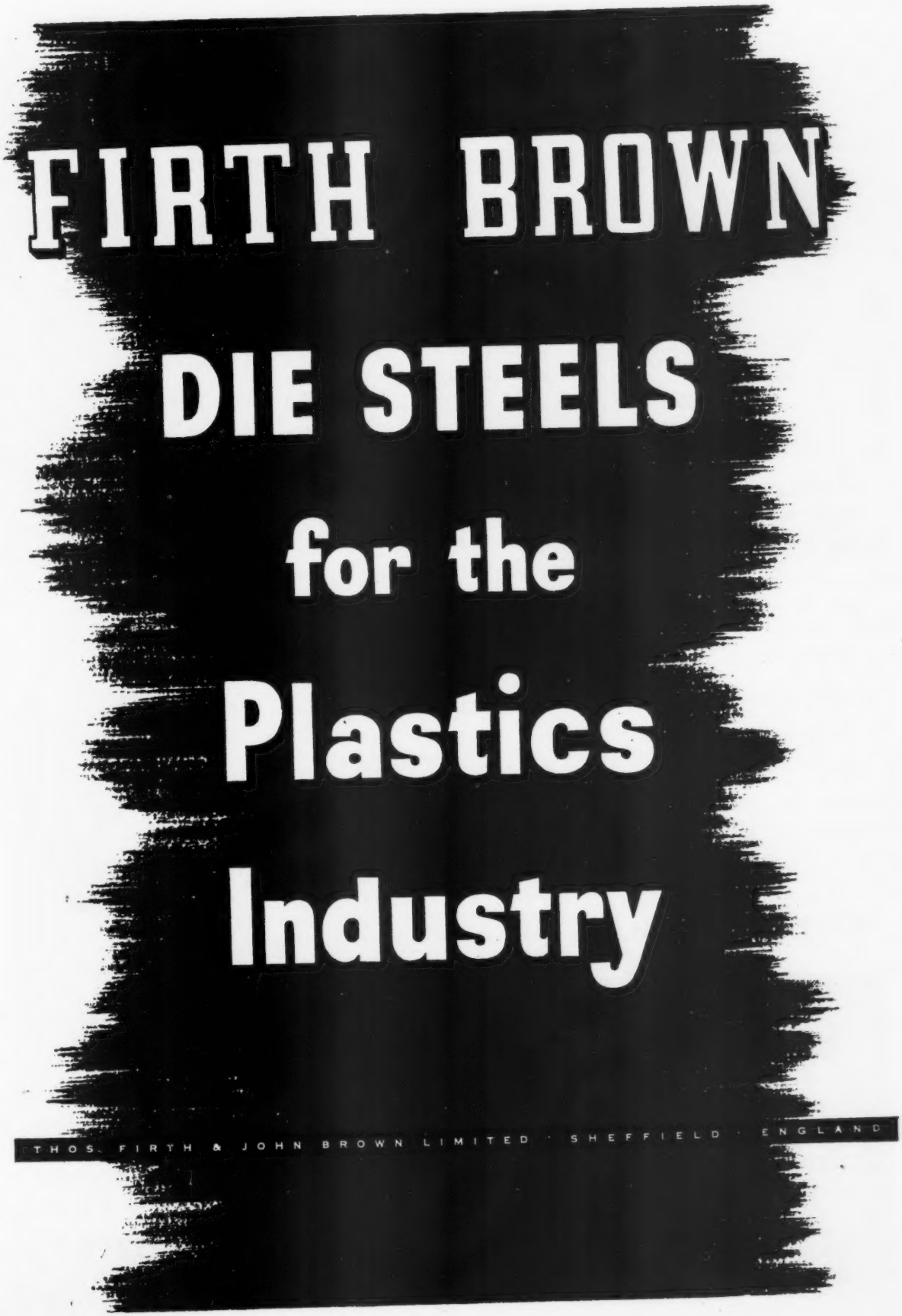
Please write or 'phone Bakelite Limited for booklets detailing the applications, advantages and economic uses of these modern materials.

BAKELITE TRADE MARK *Polyester* RESINS

Bakelite Limited · 12-18 Grosvenor Gardens · London S.W.1 · Telephone: SLOane 0898

*Producers of **Bakelite** Polyester Resins · **Bakelite** Phenolic & Urea Resins, Cements & Adhesives · **Bakelite** Phenolic, Urea, Alkyd & Silicone Moulding Materials · **Bakelite** Laminated Sheet, Rod & Tube · **Bakelite** Glass Fibre & Asbestos Laminates · **Vybak** PVC Moulding & Extrusion Compounds **Vybak** Rigid & Flexible PVC Sheet · **Warerite** Decorative Laminated Plastics.*

TGA 819


FIRTH BROWN
DIE STEELS
for the
Plastics
Industry
THOS. FIRTH & JOHN BROWN LIMITED · SHEFFIELD · ENGLAND

GREATER DEFINITION OF DETAIL

For mass production...

Vacuum formed

'Cellastine'

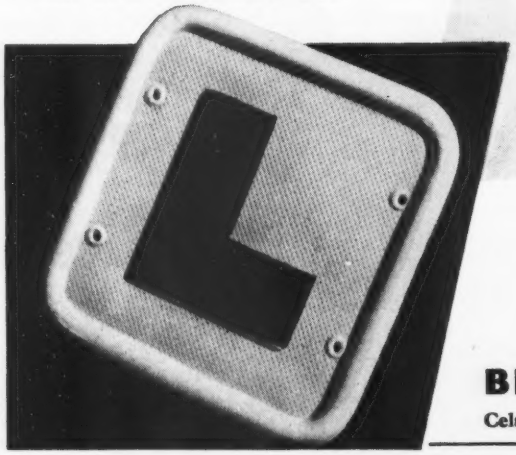
Acetate Sheeting has so many advantages...

Here's five good reasons why !

- Greater depth of draw
- Accurate reproduction of detail
- High gloss finish
- Speed and economy of production
- Colour, toughness and quality.

GREATER DEPTH OF DRAW

HIGH GLOSS FINISH



Demonstration of Vacuum forming with 'Cellastine' can be arranged by appointment. Come and discuss your problem of equipment and mould design, etc.

'L' Plate by Creators Limited, Woking. *Space Helmet by British Artware Limited.*

BRITISH CELANESE LIMITED

Celanese House, Hanover Square. London, W.1. Mayfair 8000

and NOW

MODIFIED POLYTHENE

and

IMPACT STYRENE

produced by

R. H. C. RECLAMATIONS

to meet the New Demands of the Toy Trade

Just a Reminder — our reclaimed

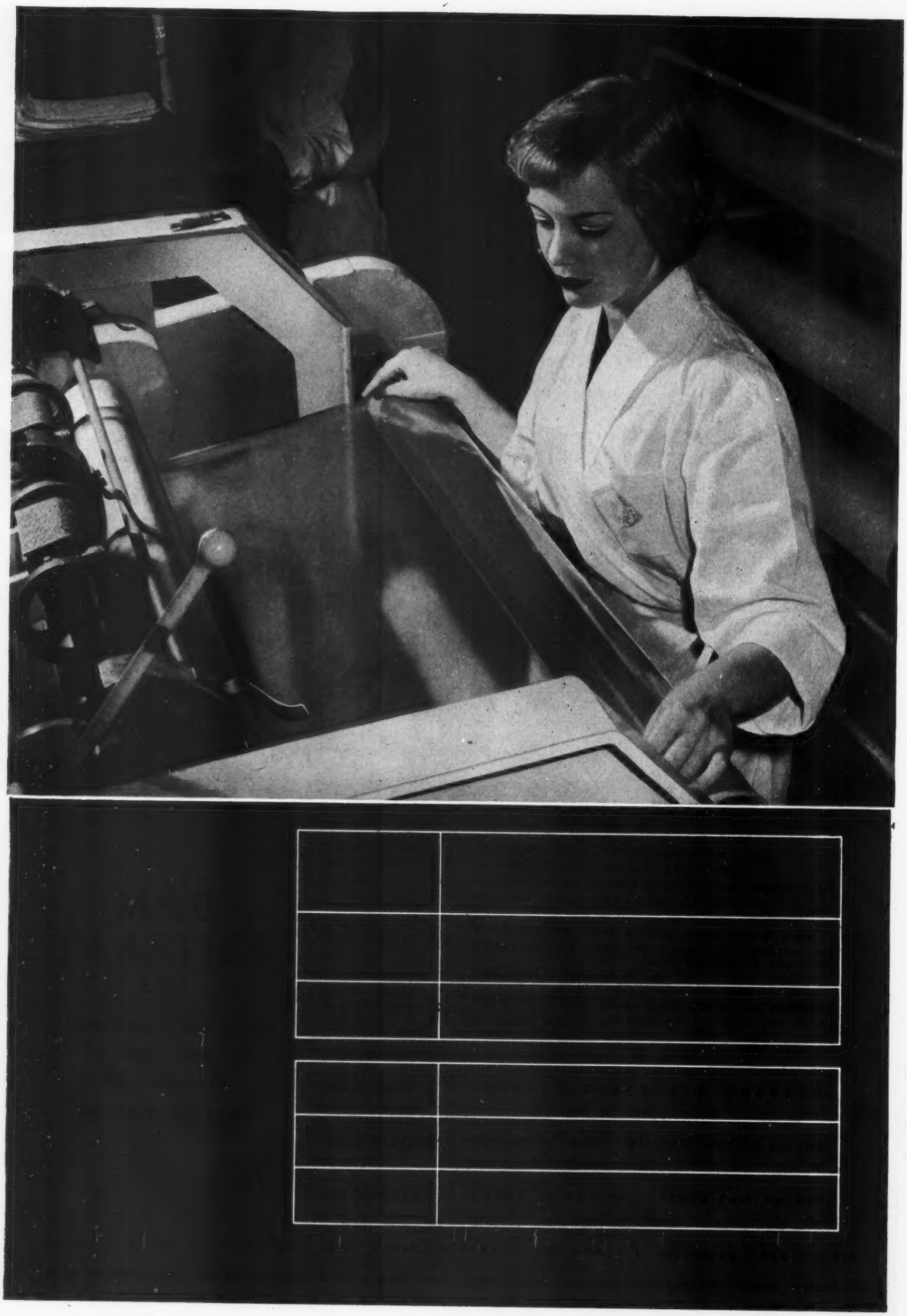
POLYTHENE
POLYSTYRENE
CELLULOSE ACETATE

are available in bulk quantities to cost-conscious buyers in all industries

R. H. COLE & COMPANY LTD

2 CAXTON STREET · WESTMINSTER · LONDON · SW1

Telephone: ABBey 3061 (10 lines) Telegrams: GERATOLE, PHONE, LONDON



KEEPING ELECTRICITY IN ITS PROPER PLACE IS THE BUSINESS OF

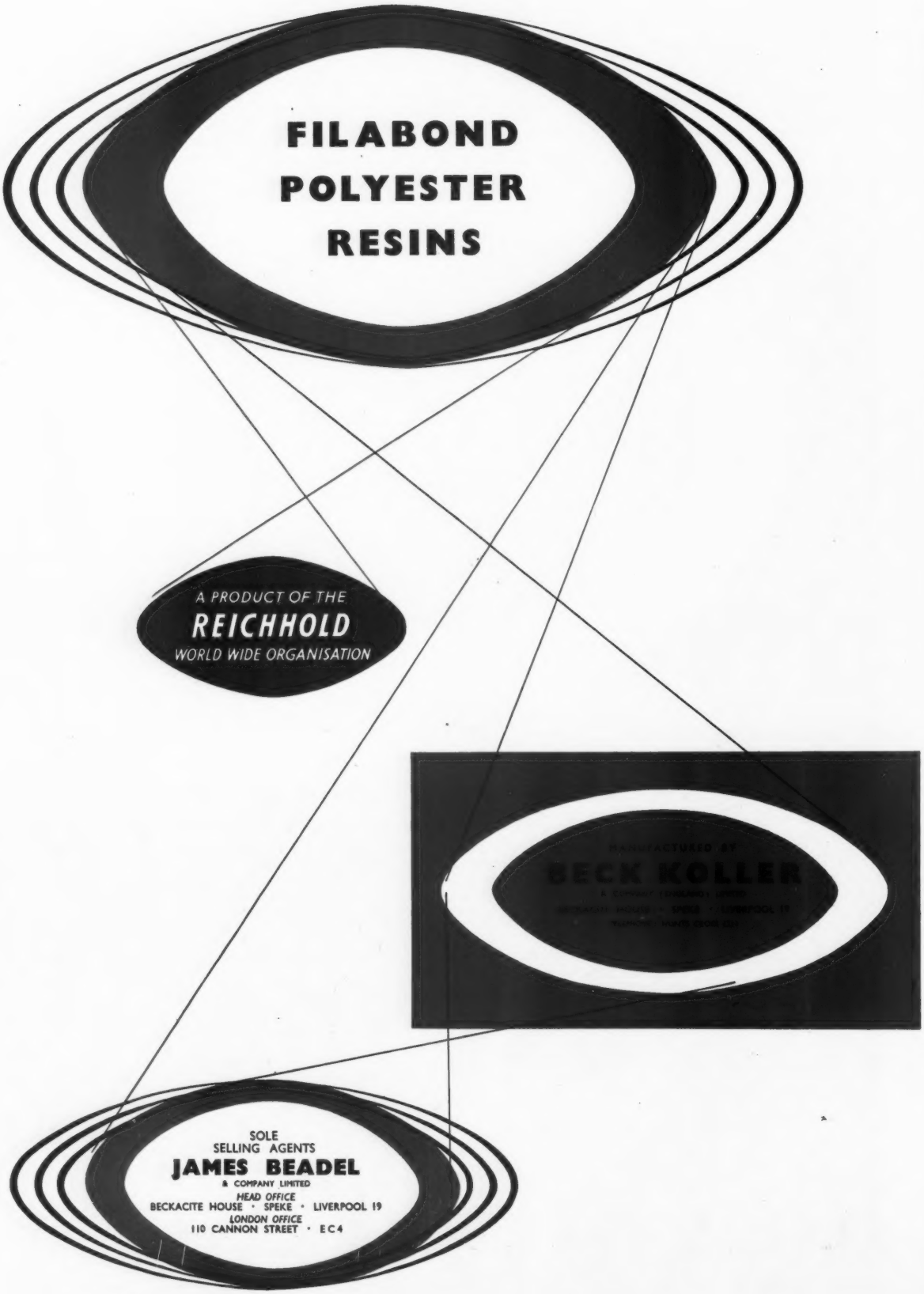
THE MICANITE & INSULATORS CO. LTD.

m and i

EMPIRE WORKS · BLACKHORSE LANE · WALTHAMSTOW · LONDON · E.17

BRANCH OFFICES AT BIRMINGHAM · CARDIFF · GLASGOW · MANCHESTER and NEWCASTLE-UPON-TYNE and representatives in most countries throughout the world. In CANADA, MICANITE CANADA LTD.

Manufacturers of MICANITE (Built-up Mica Insulation). Fabricated and Processed MICA. PAXOLIN Laminated Materials. PANILAX Laminated Materials and Mouldings. EMPIRE Varnished Insulating Cloths and Tapes. HIGH VOLTAGE BUSHINGS & TERMINALS. Distributors of Micoflex-Duratube Sleevings, Micoflex-Durasleeve (Plastics-covered flexible metal conduit), Durajoint (Patented expansion jointing for concrete structures) and Kenutuf Injection Mouldings (in most thermoplastics including P.V.C.).


FILABOND
POLYESTER
RESINS
A PRODUCT OF THE
REICHHOLD
WORLD WIDE ORGANISATION
MANUFACTURED BY
BECK KOLLER
SOLE
SELLING AGENTS
JAMES BEADEL
& COMPANY LIMITED
HEAD OFFICE
BECKACITE HOUSE · SPEKE · LIVERPOOL 19
LONDON OFFICE
110 CANNON STREET · EC4

WE CLAIM TO BE *THE SPECIALISTS* IN ....

INJECTION MOULDING

LET US SOLVE YOUR PROBLEMS!

We offer a range of machines that produce mouldings of the highest quality.
Their capacity can be increased using DOUBLE - SHOT MECHANISM

EDGWICK 'HY' FULLY-AUTOMATIC INJECTION MOULDER
(SEMI- OR FULLY AUTO
IN STOCK)

RANGE INCLUDES:

HERBERT/REED-PRENTICE

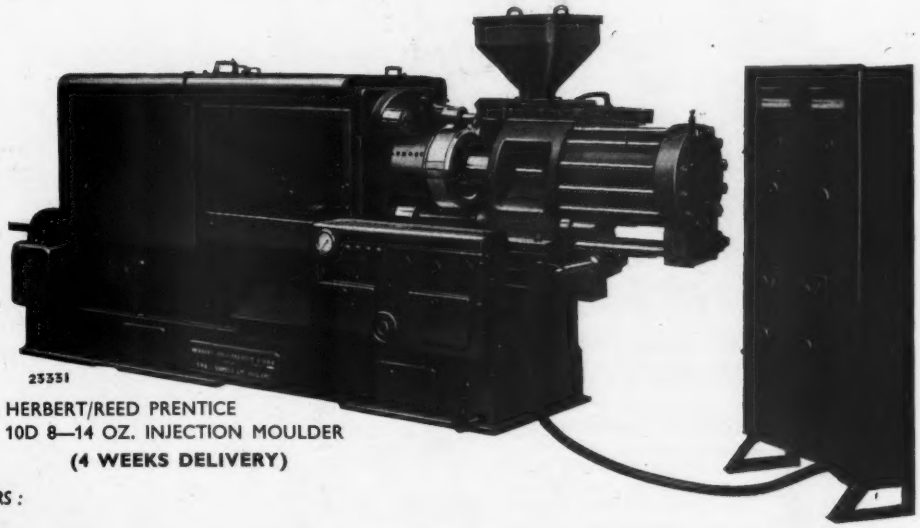
These machines are built in this country under licence. Self-contained and hydraulically operated. Manual, semi- or fully-automatic operation. Easy to operate. High rates of production. DOUBLE-SHOT MECHANISM increases capacity of machine by double packing.

THREE SIZES: 4 oz., 8 oz. and 16 oz. Capacities.

EDGWICK

This machine is offered with either semi- or fully-automatic operation. DOUBLE-SHOT MECHANISM can be fitted.

SIZE: 1½ oz. Capacity.



HERBERT/REED PRENTICE
10D 8—14 OZ. INJECTION MOULDER
(4 WEEKS DELIVERY)

WRITE FOR FULL PARTICULARS:

SOLE AGENTS:

ALFRED HERBERT LTD · COVENTRY

FACTORED DIVISION · RED LANE WORKS 'PHONE: 89221

B

BUILD YOUR

I.C.I. Plastics Division makes 75% saving. *I.C.I. Plastics Division at Welwyn Garden City urgently needed a special tower structure for experimental work. A quotation was obtained for conventional steelwork, but it was then decided that Dexion would be quicker and cheaper. In fact, a saving of 75% was achieved. Substantial savings can be made by building your own equipment with Dexion slotted angle.*

ROWN EQUIPMENT—

quickly, cheaply, strongly, exactly as you want it—with versatile DEXION slotted angle

FOR almost any kind of works or storage equipment you may need —storage racking, machine-stands, trolleys, work-benches, maintenance platforms, and a hundred other items —you'll find Dexion Slotted Angle the sturdiest, cheapest, most versatile material.

Dexion is far easier and quicker to work with than wood or angle iron. It merely needs cutting and bolting together — no precise measurements or detailed drawings, no drilling or welding, no skilled carpentry, no painting. *The work has been put into it already*, so that unskilled labour can handle any job. You get exactly the structures you need, without delay, and generally at a big saving.

Dexion is scientifically designed so that every slot and hole has a function, and the remaining metal is left where it gives greatest strength. It *continues* to save you money, because any Dexion structure can be swiftly altered or dismantled and the Dexion used again. There is no waste, no scrap.

Dexion is the Slotted Angle that started an industry. Now, over 100 million feet are being used by more than 60,000 firms all over the world. *And 80 per cent of Dexion sales are repeat orders.*

GET THE FACTS

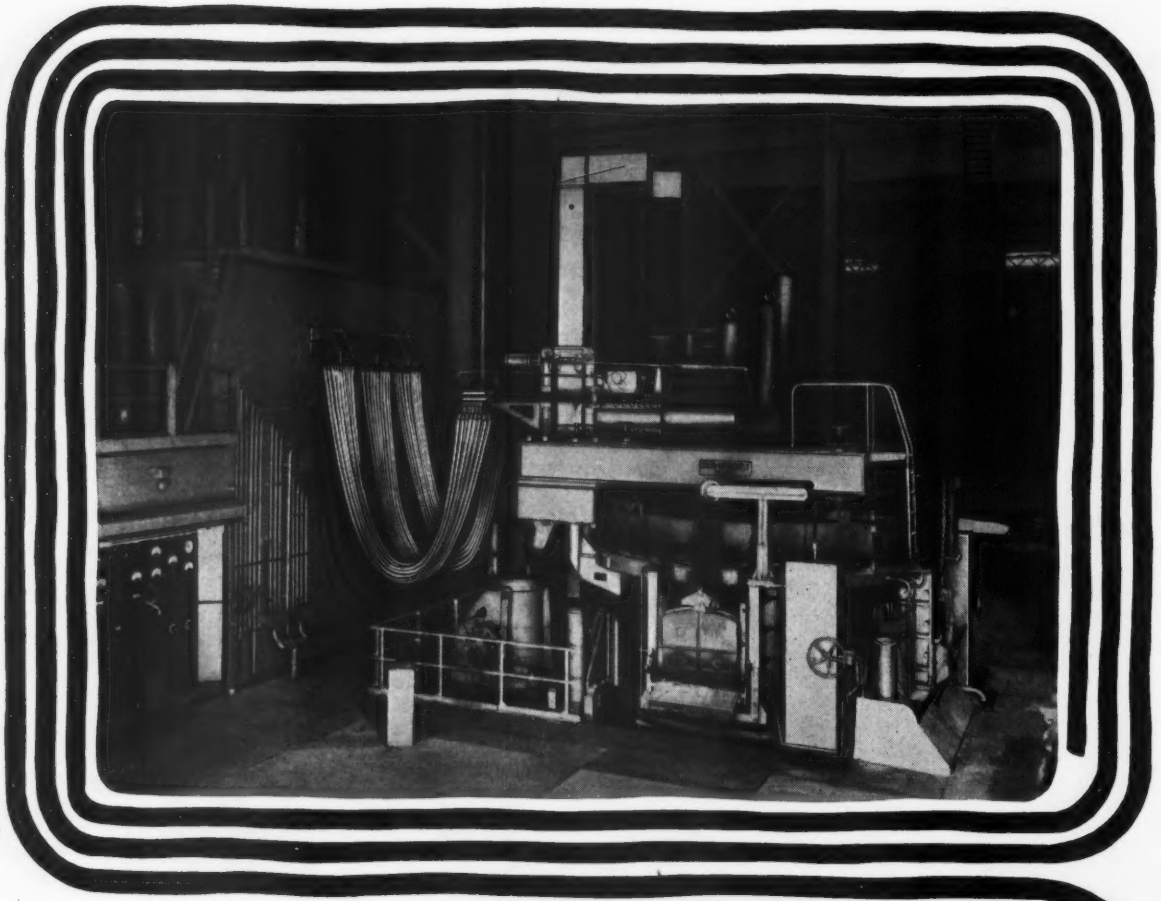
Dexion 225 is sold in packets of ten 10-ft. lengths, complete with bolts. Steel Dexion (price from 1/3½ to 1/5 per foot) is rust-protected, stove enamelled. Where a light but strong, non-magnetic, non-corroding material is required, use Alloy Dexion (full technical details and prices on request). Dexion Service offers advice or design assistance on any problem, and construction teams are available. Send today for sample piece of Dexion and booklet AR.131 illustrating uses in many industries. Dexion Ltd., 65 Maygrove Road, London, N.W.6 (Phone: MAIda Vale 6031-9).

DEXION

REGD.

SLOTTED ANGLE

BX Plastics Ltd. Miltoid Sales Department builds space-saving store. *Miltoid Sales Department, which handles a wide range of BX Plastics products in different colours, thicknesses and sizes, needed a space-saving store for their stock, giving ease of handling and selection. With Dexion they built this store themselves, using the space from floor to ceiling.*



Having a hand in Productivity

In every industry or trade, electrical equipment is the key to modern production methods. There are probably more production-boosting and money-saving devices than you know of. Your Electricity Board can help you and give you sound advice.

They can also make available to you, on free loan, several films on the uses of electricity in Industry — produced by the Electrical Development Association.

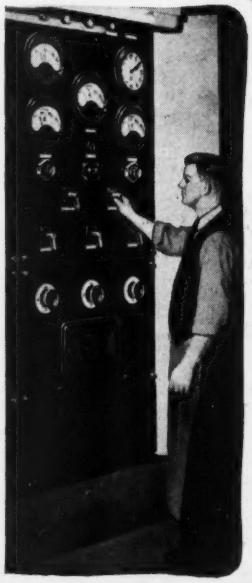
E.D.A. are publishing a series of books on " Electricity and Productivity ". Four titles are available at the moment; they deal with Higher Production, Lighting, Materials Handling, and Resistance Heating. The books are 8/6 each (9/- post free) and the Electricity Boards (or E.D.A. themselves) can supply you.

The British Electrical Development Association,
2 Savoy Hill, London, W.C.2.

Steel - exactly!

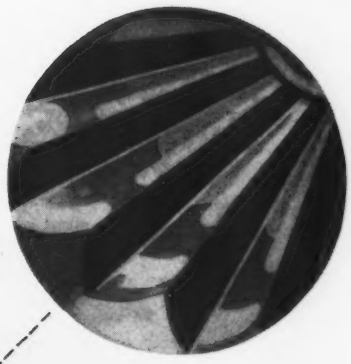
The hand is on a lever, a small lever that is light to operate. But through that lever the hand is controlling the powerful current necessary to melt 20 tons of steel in an electric furnace. And because the furnace is electric the hand is doing much more than that. It is controlling the making of steel quickly, economically, exactly. Whether it be for production of exact-analysis steel or of cast iron from the lowest grade of scrap, there is nothing to beat the electric furnace. But the electric furnace is

only one of the aids to higher Productivity that Electricity can bring you.

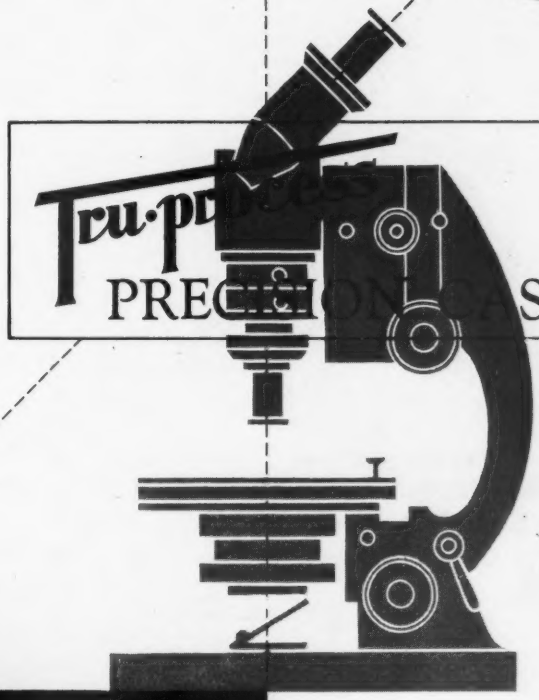


Electricity a Power of Good for PRODUCTIVITY

Microscopic detail is reproduced on our . . .



Tru-process precision castings are being used for dies and moulds for the Plastic and other industries in a varying range of alloy steels.



Tru-process PRECISION CASTINGS

Mould produced in Stainless Steel for the manufacture of fancy glass sugar basins.

DARWINS LTD

TOLEDO THE DARWINS GROUP

TINSLEY · SHEFFIELD · 9

D.74

Why so many repeat orders

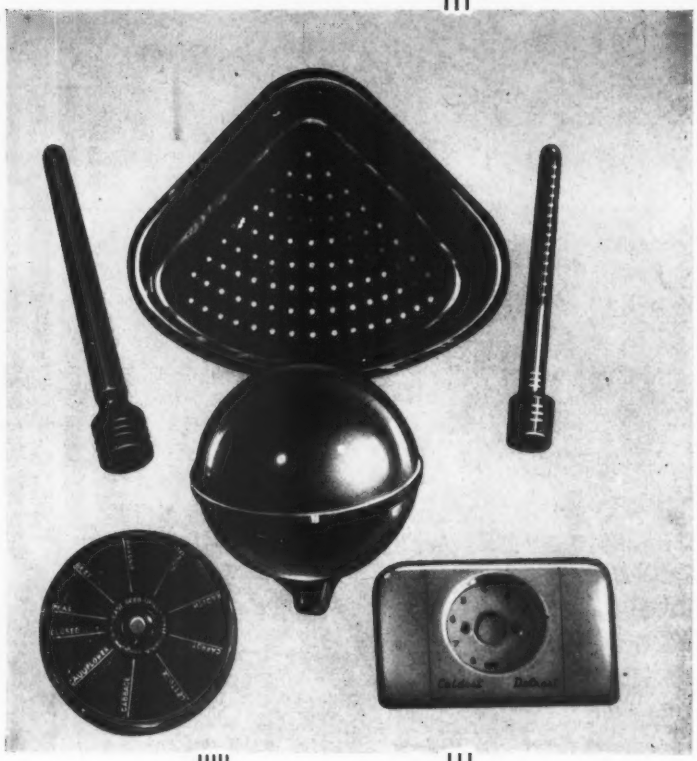
for the E.M.B. No. 9 (6 oz.) Injection Moulder?

There is only one answer—practical experience with the machine.

For maximum production, week in week out, with negligible maintenance, the machine has no equal—at least that is a good enough reason for some of the largest injection moulders in the country.

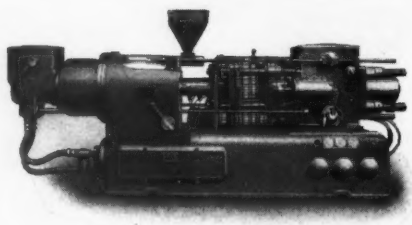
If you need further testimony one of our engineers will be glad to give you the facts.

It will pay you to investigate this new 6-oz. machine with the increased output. *Send for catalogue M326.*



The new E.M.B. No. 9c Injection Moulder includes :—

1. **A 6-oz. cylinder.**
2. **Kelvin Hughes scanning control of heating cylinder.**
3. **Controlled injection speed.**
4. **Higher speed of platen operation.**



EMB No. 9c Injection Moulder

CAPACITY

Maximum die size	11¾" × 18"
Die thickness max. : min. ..	12" — 2"
Movement of platen	7¾"
Plasticising capacity with 6-oz. cyl.	52 lb./hr.

E.M.B. Co. Ltd.

WEST BROMWICH——————ENGLAND

deep are the roots . . .

Forty years' experience in moulded plastics. That's the G.E.C. record in a still young and expanding industry. Planning and producing insulating components and moulded parts for a wide range of industrial and domestic products, the G.E.C. can place at your disposal mass production facilities backed by the intensive study of plastics, from the research laboratory right through to the finished article.

This refrigerator tray in Polystyrene material is a typical example of the large variety of mouldings made by the G.E.C.

moulded plastics for industry

THE GENERAL ELECTRIC CO. LTD., MAGNET HOUSE, KINGSWAY, LONDON, W.C.2.

whatever your purpose

take the pick of plastics from the **GREENWICH** range

The very wide study made by Greenwich of the many different requirements in plastics to-day has resulted in the production of a really comprehensive range to meet all needs.

1. **FOR RAINWEAR—CRAYMAC** strong and flexible vinyl plastic sheeting with crease resistance and a fine silky finish. Craymac welds and stitches, and is available in a wide range of colours and printed and textured effects, and a variety of thickness gauges.

2. **FOR CURTAININGS—CRAYMAC** printed and textured plastic sheeting, in a whole array of appealing colours and designs. Both texture and colours are permanent.

3. **FOR INDUSTRIAL AND OUTDOOR CLOTHING—CRAYTEX** high-quality P.V.C. coated fabric for industrial clothing, rain capes and rainproof coats, in a variety of weights and grains. Also available with a fleecy back and grained surface, in many fashion shades for windjammers, casual wear and other warm weatherproof garments.

4. **FOR PACKAGING—CRAYLENE** vinyl packaging film that protects goods against dust, damp and atmospheric impurities. In roll form 36 inches to 54 inches wide in many thicknesses, or made up into envelopes, bags or drum liners to specification.

GREENWICH PLASTICS LTD

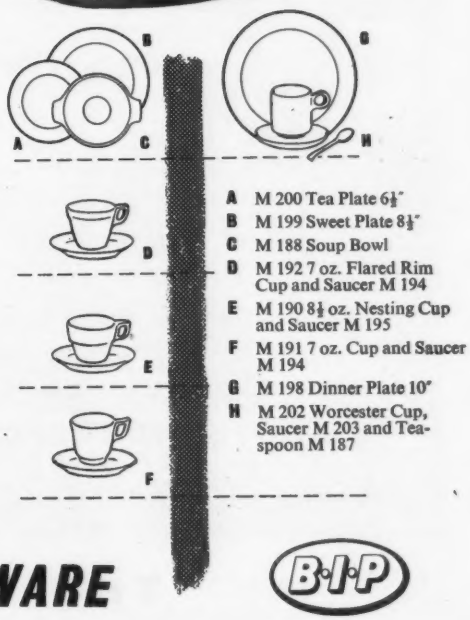
Greenwich PRODUCT

Send for free pattern folders to
GREENWICH PLASTICS LTD., St. Mary Cray, Kent, England
Telephone: Ravensbourne 4674/5 and Orpington 25671/2/3

lasts . . .

many times longer

Streetly Melamine Ware far outlasts chinaware. Results vary according to the item and conditions of use, but five times the life is by no means unusual and this is often exceeded. Here is the logical, economic answer for large-scale catering in Industrial Canteens, Hospitals, Schools and catering establishments—items that will not easily chip or crack; that are light to handle and pleasant to use; that help in every way to speed up service, cut down overheads. Write for descriptive leaflets.



A M 200 Tea Plate 6½"
B M 199 Sweet Plate 8½"
C M 188 Soup Bowl
D M 192 7 oz. Flared Rim Cup and Saucer M 194
E M 190 8½ oz. Nesting Cup and Saucer M 195
F M 191 7 oz. Cup and Saucer M 194
G M 198 Dinner Plate 10"
H M 202 Worcester Cup, Saucer M 203 and Teaspoon M 187

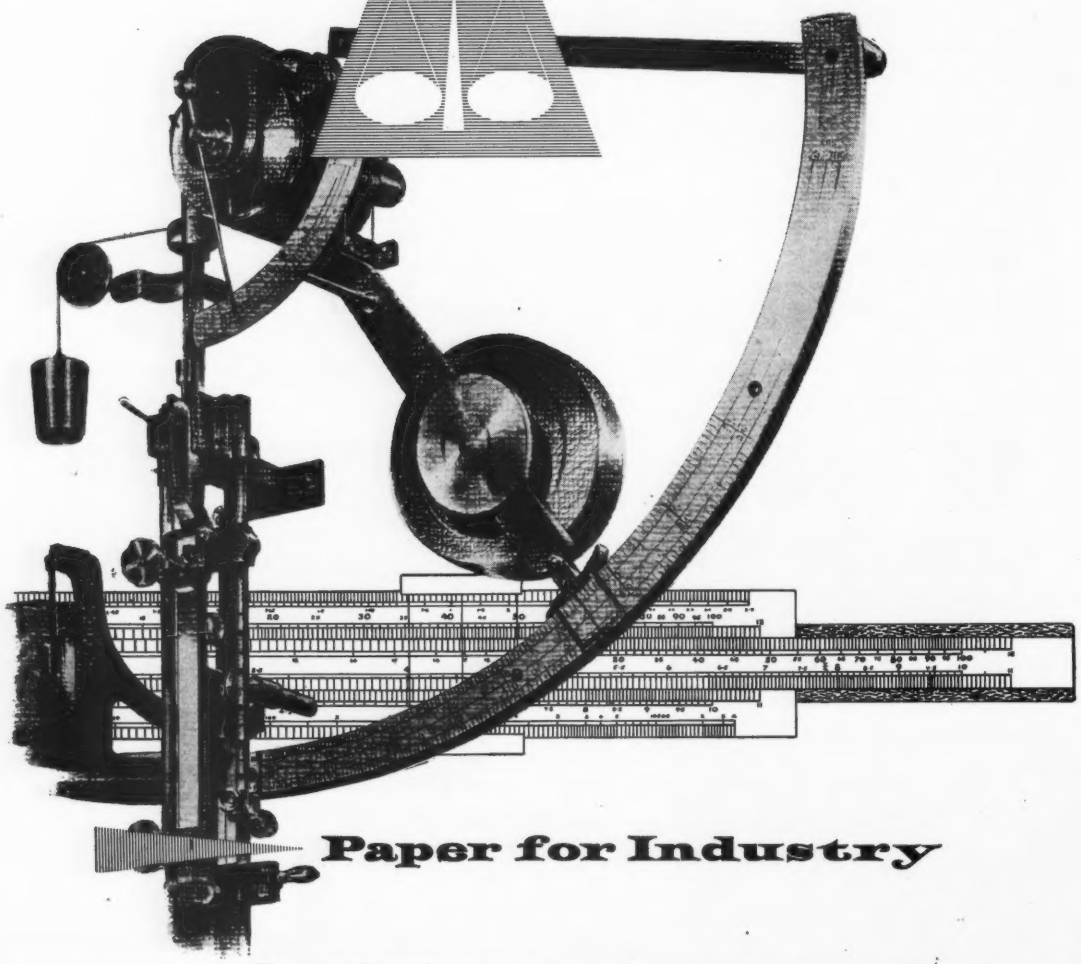
Serial No. ★ 1000
BRITISH GOOD HOUSEKEEPING INSTITUTE GUARANTEES
REFUND OF MONEY OR REPLACEMENT IF NOT IN CONFORMITY WITH THE INSTITUTE'S STANDARDS

STREETLY MELAMINE WARE

B·I·P

THE STREETLY MANUFACTURING CO. LTD., 1, Argyll Street, London, W.1. *Telephone:* GERrard 7971

control



Paper for Industry

Papermaking is not yet a precise science, and as a compromise between conflicting requirements in paper has often to be made, it is only by very careful scientific control that the final specification can be met. The Wiggins Teape Group is well equipped with the most up-to-date control methods and in addition has nearly 200 years of papermaking know-how and experience. New industrial uses for paper cover a large part of the Research programme of the Group.

Wiggins Teape
FINE PAPER MAKERS
LONDON
1761

THE WIGGINS TEAPE GROUP

46-58 MANSELL STREET, LONDON, E.1 ROYAL 7210

U·M·P

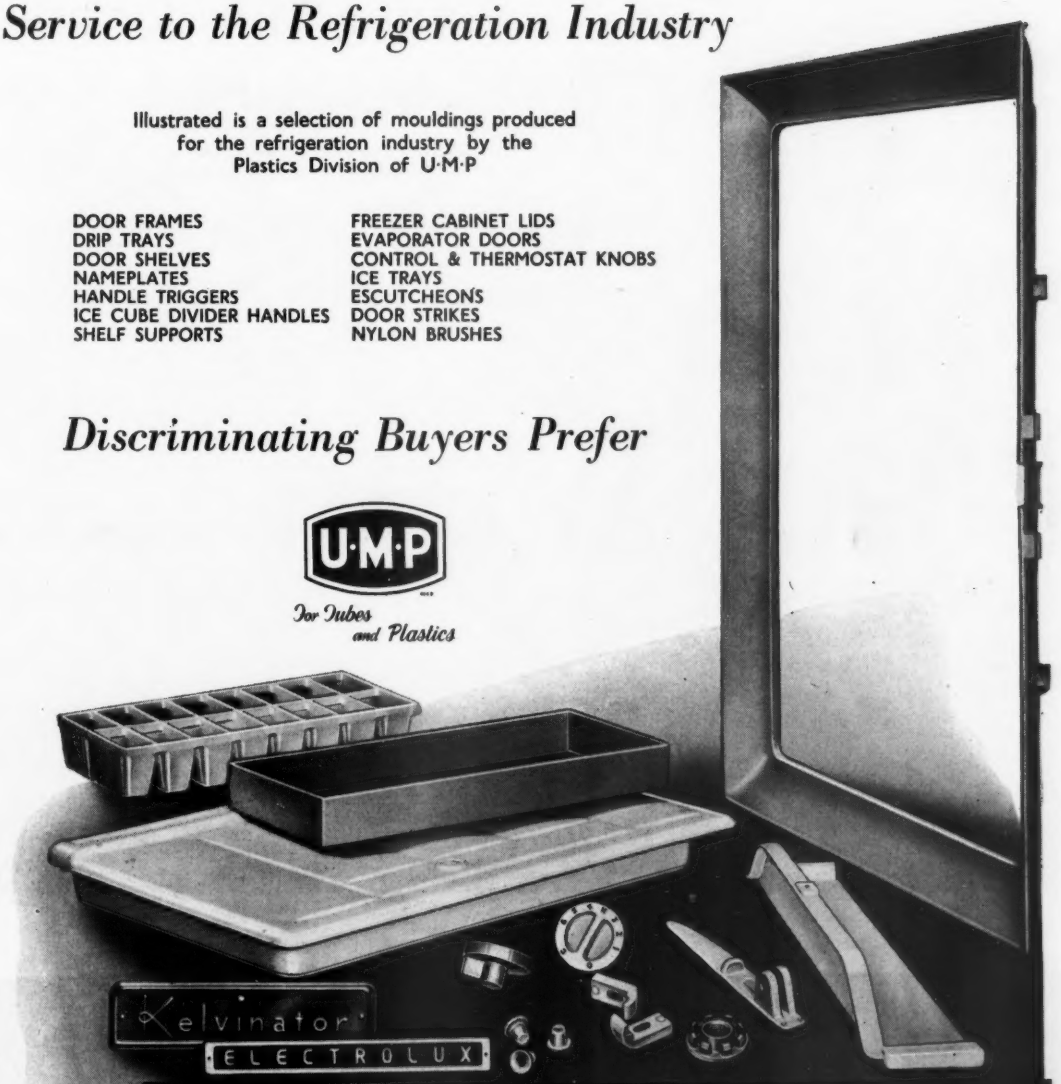
Service to the Refrigeration Industry

Illustrated is a selection of mouldings produced for the refrigeration industry by the Plastics Division of U·M·P

DOOR FRAMES	FREEZER CABINET LIDS
DRIP TRAYS	EVAPORATOR DOORS
DOOR SHELVES	CONTROL & THERMOSTAT KNOBS
NAMEPLATES	ICE TRAYS
HANDLE TRIGGERS	ESCUTCHEONS
ICE CUBE DIVIDER HANDLES	DOOR STRIKES
SHELF SUPPORTS	NYLON BRUSHES

Discriminating Buyers Prefer

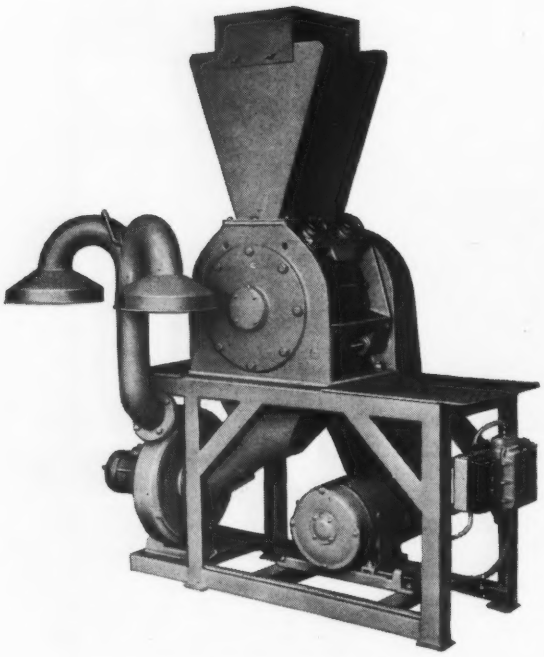
U·M·P
for Tubes and Plastics



UNIVERSAL METAL PRODUCTS LTD.
SALFORD 6 LANCS. *Telephone:* PENDLETON 4444
LONDON OFFICE: ARGYLE HOUSE, 29/31, EUSTON ROAD, N.W.1. TEL. TERMINUS 2073

machinery from IPL

The Condux



Model C.S.4 : Capacity 400 lb./hour

Cutting Mills for granulating any kind of thermoplastic film, sheets, cords, lumps ready for injection or extrusion.

Six sizes with capacities from 35-2,000 *lb. per hour*

Condux also manufacture pulverising plant, toothed and pinned disk mills, refiners, rubber crushers and cutters, hammer mills, disintegrators, etc.

The range of machinery from I.P.L. includes :

Girovinyle Granulators
Pourtier Spark Testers
Fluidflow Screener/Conveyors
Bandera Extruders
Decombe Coilers
Sommer Injection Presses
Hartig Extruders

For full details and demonstration please contact

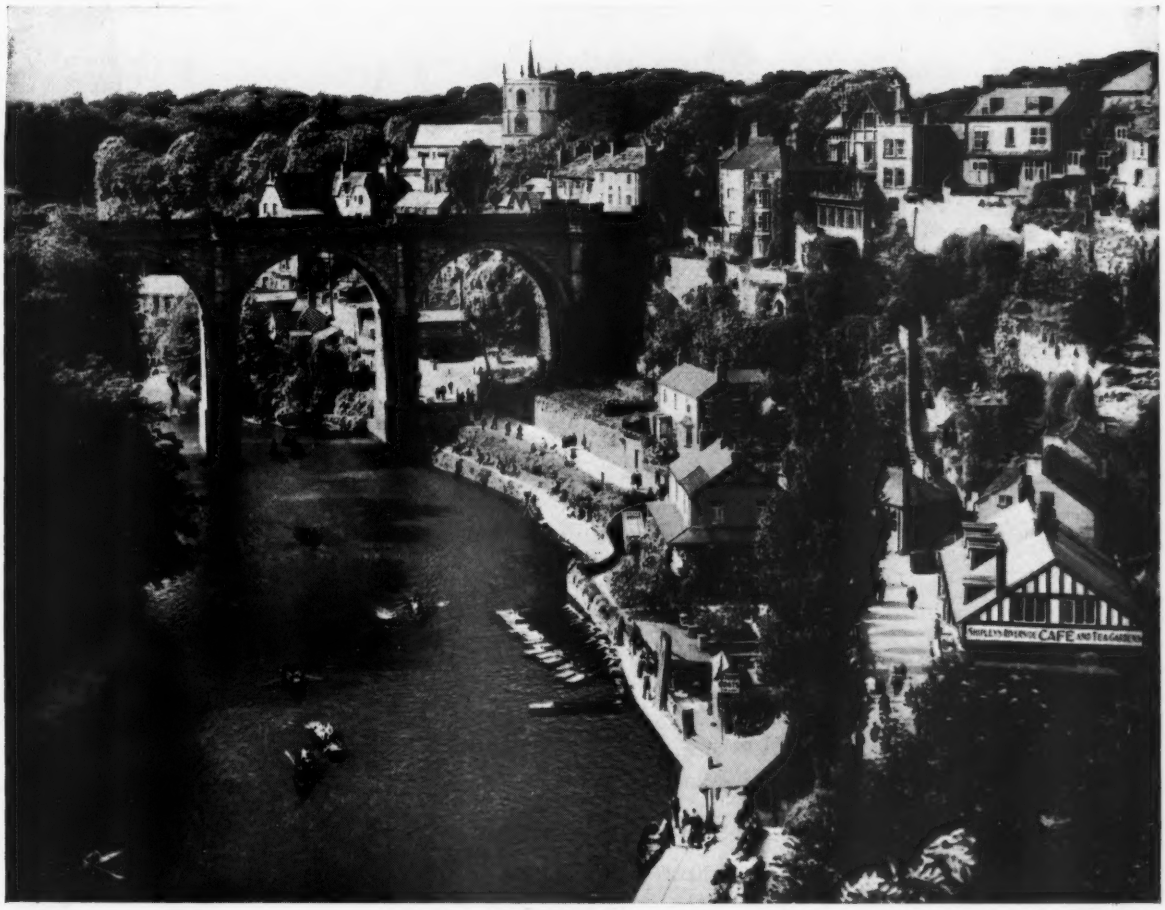
IPL **INDUSTRIAL PLASTICS LIMITED**

LONDON & EXPORT OFFICE 93 Regent Street, London W.1
Telephone: REGent 3146/9 Cables: Ipla London
MACHINERY SHOWROOMS 93 Harrow Road, London W.2.

Beautiful Yorkshire

River Nidd at Knaresborough

BIRKBYS LTD · LIVERSEDGE · YORKSHIRE



"ELO" SYNTHETIC RESIN PRODUCTS

Embracing Completed Mouldings, Moulding powders, Resins, solid, powdered, or in solution, Insulating Varnishes, Cements, Lacquers, Anti-friction resins for fabric bearings, Capping cements, Filling Compounds, Sealing fluids.

London Office: 79 Baker Street, W.1.

Moulding the future . . .

The White Lady of the Moonfleet—by Hutchings & Son of London. Favourite sports: water ski-ing and racing. Yes, she's fast enough for that. Thirty knots from ten horses—nice going. And nice lines: her 13′ 4″ x 5′ hull moulded in one piece of F.R.P. No rusting, no rotting, no corrosion, no future for termites. No trouble, in fact. Wrap up the works, and you can leave the White Lady in back garden or garage, tow her 600 lbs. by trailer to river or sea. An attractive proposition? F.R.P. *always* makes an attractive proposition.

Fibreglass have an F.R.P. advisory service which is expert, confidential and free.

FIBREGLASS TRADE MARK **the backbone of Reinforced Plastics**

FIBREGLASS LIMITED, RAVENHEAD, ST. HELENS, LANCS. ST. HELENS 4224. FACTORIES AT ST. HELENS, LANCS. AND POSSILPARK, GLASGOW

Centenarians May Sneer

at a firm with a mere 50 years record for successful progress to their credit. But if we are on the young side by some standards, we are healthy and vigorous. Although our name is primarily associated with the motor industry we have over the past few years been developing a Plastic side to the business. We have put in some very fine modern presses for compression moulding, and machinery for extrusion work too. We make the tools as well, and can start work immediately on receipt of your drawings. Our main output is for the Electrical and Engineering industries—such things as switch-gear panels, telephone and radio components and cases, control knobs of every kind, electric iron or saucepan handles and so on. In any colour and in any quantity. We should welcome your enquiries—you would find that the reputation for reliability and service which we have enjoyed for 50 years in the car trade extends to our Plastic side too.

Coventry Motor Sundries

COVENTRY MOTOR AND SUNDRIES CO LTD
SPON END, COVENTRY. TEL: COVENTRY 40363/4

Cogent

...to Tyburn Road Tolerances

If you were to set up in business as a mouldmaker, you would have to decide, as we did, which aspect of the moulding industry you would seek to serve; that is to say, whether you would prefer the straightforward jobs made to ordinary standards, or would endeavour to obtain that type of work which demands far deeper technical comprehension, greater ingenuity, and the highest attainable standard of craftsmanship in its execution.

We chose to be specialists. The implications of that choice are far-reaching, for even when the most efficient machines have been installed and the finest craftsmen trained, continued success can only result from a complete and live awareness of the tooling problems of the modern moulder. We have the men, the machines, the experience, and have established Tyburn Road standards as second to none. Nowhere is a real "problem" job more enthusiastically welcomed, more knowledgeably planned, more skilfully executed than by . . .

B·I·P

THE CRAFTSMEN OF TYBURN ROAD

B·I·P TOOLS LTD

Tyburn Road · Erdington · Birmingham 24 · *Phone:* Birmingham East 2061 · *Grams:* Plasmould Birmingham 24

MEMBER OF THE GAUGE AND TOOL MAKERS' ASSOCIATION

Tumble for twenty minutes

POLYSTYRENE stocks for injection moulding present no problem if you use Erinoid colourant blend 1Coo8 and Erinoid blended dyes. Only 15-20 minutes in the tumbling drum are necessary. No need to carry large stocks of coloured polystyrene—just the crystal clear colourant blend and the dyes

ERINOID 1Coo8 is a small, uniform granulation of crystal clear polystyrene, free from fines and ideal for dry colouring. It is available in KLP, 2CL, HS and 2CL/HS formulations. Erinoid blended dyes give excellent colour dispersion and light stability—free from marking off. 1Coo8 is packed in 50 lb. bags, the dyes in packets sufficient to colour 50 lb. of 1Coo8.

Erinoid **COLOURANT SERVICE**

Erinoid polystyrene is manufactured by

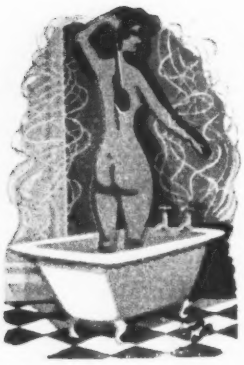
STYRENE PRODUCTS LIMITED

Full information, samples, prices, etc., on application to

ERINOID LIMITED · STROUD · GLOUCESTERSHIRE

Telephone: Stroud 810

LONDON OFFICE: 96 Piccadilly · London W1 · Telephone: GROsvenor 7111



Between this girl's bath
and the wall
There used to be nothing
at all
Till a lively young lad
Thought: I've got it,
begad!
PVC would undoubtedly
make an effective,
economical, attractive and
easy-to-fit sealing-strip.

A motor designer from
Lancs
Gratefully murmured his
thanks
When a Lorival chap
After doffing his cap
Suggested that PVC
would make an effective,
economical and easy-to-fit
petrol tubing.

Some limericks – from the

A fireman, talking aloud
Made this remark to the
crowd
Some boffin, I hear
Has a darned good idea
He says that PVC
would make a remarkably
effective, tough, durable
fire hose lining.

There once was a
Scotsman of Fife
Whose packaging
problems were rife
Until one day he spoke
To a Lorival bloke
Who said that PVC
sheeting would be an
effective, economical,
moisture-and-chemical-
proof answer to his
packaging problems.

lively lads at Lorival . . .

An electrical fellow
near Speke
Discovered a terrible
leak
But along came his
mate
At a helluva rate
Saying that Lorival
PVC would make an
effective, economical
insulating material for
all sorts of electrical
work.

PVC, in the hands of Lorival's lively lads, can do a lot of jobs better and cheaper. Why not drop a line to Lorival? Then you can get together with the lively lads and figure out ways and means of using PVC to your advantage.

LORIVAL PLASTICS

United Ebonite & Lorival Ltd., Little Lever, Nr. Bolton, Lancs.

L63

BEETLE QUALITY COMES IN OVER 300 STANDARD COLOURS

300 plus...
and a colour-matching service, too!

B·I·P materials—the highest quality urea and melamine moulding powders on the market—offer unbeatable colour possibilities, not only in the range immediately available, but also in the quick, accurate colour-matching service which will match even quite modest requirements without extra charge. A number of different grades of Beetle urea and Melmex (melamine) materials are available for general or specialized uses. The majority can be supplied in easy, easy/medium, medium or stiff flow types and they are made to pellet satisfactorily.

B·I·P PRODUCT AND MOULD DESIGN SERVICES

. . . are freely offered to moulders and their principals. B·I·P's designers and technicians are readily available for consultation and will prepare product designs and working drawings in the strictest confidence without any charge.

"Beetle" is a Registered Trade Mark in Great Britain and most other countries

BEETLE and MELMEX ulding powders B·I·P

London: 1, Argyll Street, W.1 Telephone: GERrard 7971

The LUSTREX* *range is ready for battle with production problems.*

What can you make with Lustrex polystyrene? Packages and picnic sets; refrigerator fittings, radio cabinets, instrument panels; camera spools and small cable drums. In fact, almost anything. You can make them *extra* strong—with *Lustrex Toughened 1.* You can produce any colour you wish from a single crystal stock—with *Lustrex Colourant Blend.* You can cut cycle time by up to 15%—with *Lustrex Hi-Flow 55.* And you can use *Heat Resistant Lustrex* for applications where slightly higher temperatures are normal to every day use. Economical Lustrex is light yet strong. It does not shrink or become brittle. All grades can be used in standard injection moulding equipment.

Write now for full details.

MONSANTO PLASTICS LIMITED

191 Victoria Station House, Victoria Street, London, S.W.1 and at Royal Exchange, Manchester, 2

MONSANTO

In association with: Monsanto Chemical Company, St. Louis, U.S.A. Monsanto Canada Ltd., Montreal. Monsanto Chemicals (Australia) Ltd., Melbourne. Monsanto Chemicals of India Limited, Bombay. Representatives in the world's principal cities.

Between the two...

HEXAPLAS PPL

low viscosity ★
very low volatility ★
good resistance to extraction ★
relatively low cost ★

For use with vinyl chloride polymers and copolymers, and certain synthetic rubbers.

a new polymeric plasticiser,

intermediate between the high molecular weight polymeric plasticisers such as Hexaplas PPA and the conventional monomeric plasticisers.

Full information on request:
IMPERIAL CHEMICAL INDUSTRIES LIMITED, LONDON, S.W.1.

ICI

D. 603

Reproduced by courtesy of the National Gallery

The progress of colour

Colour at its most sublime . . .
colour in the hands of the artist

2 OIL

Among the first artists to realise the limitations of tempera was Jan van Eyck. He wanted to depict the roundness of forms, deep shadows and soft graduations of shading. So he evolved a completely new technique of painting with oil. We do not know exactly what Van Eyck used, but it is most likely that the pigment was ground in a specially refined oil, diluted with a volatile vehicle like our essence of turpentine.

Other artists were quick to realise the possibilities of this new technique. In Italy, Giovanni Bellini used oils to obtain special surface textures, and he was followed by the great Venetians, Giorgione, Titian and Tintoretto.

Experiments and developments in oil technique have gone on, right up to the present day. For our illustration, we have chosen a painting by one of the great masters of this medium, Velazquez. It is "The Toilet of Venus" popularly known as "The Rokeby Venus," a perfect example of form, texture and colour.

Colour means much in the life of man, and plastics, with their widespread uses, are helping more and more to brighten the everyday articles we use.

EAST ANGLIA PLASTICS LTD. *52 Brook Street, London, W.1*

TELEPHONE: MAYFAIR 4823/1973 • CABLES: EANPLAST, LONDON • FACTORY AT AYCLIFFE, DARLINGTON

NESTORITE **GRADE A.1025**

ACID RESISTANT

Filler	Woodflour
Particle size (inches)	1/10
Specific gravity	1·35
Bulk factor	2·2—3·7
Powder density	0·50—0·60
Time of cure of Test Cup (secs.)	60
Recommended flow range	5—8
Shrinkage (thou./inch)	7.5—9.5
Flowability (cm.)	8—9
Brinell Hardness	35—40
Impact strength (ft./lb.)	0·15—0·19
Crossbreaking strength (lb./sq. in.)	10,000—11,000
Tensile strength (lb./sq. in.)	6,000—8,000
Water absorption (7 days) (mg.)	150·300
Dimensional stability in water (thou. per in. of mldg.)	12
Dimensional stability after heating (thou. per in. of mldg.)	4
Plastic yield grading (°C.)	140
Blister temperature (50°C. per hr. rise)	180
Electric strength at 90°C. minute value (V/mil.)	20—40
Surface resistivity after immersion ($\log_{10}$ohms)	9—11
Volume resistivity (as moulded) ($\log_{10}$ohm cm.)	10—11

This material is suitable for use in contact with battery acid. It cures rapidly, but is soft on extraction from the tool. Increase in weight after 28 days' immersion in battery acid at 60°C.—0·45%, compared with G-type material—10%. Growth after 28 days immersion in battery acid at 60°C.—Nil, compared with G-type, 10%.

The Goldfish and the Acid Test

Phineas Gloop the goldfish lived beneath the outfall from a chemical works. But one day he found that his scales were losing their lustre, and soon afterwards that he was swimming upside down in rapidly diminishing circles . . . for that outfall was strongly acid.

He was in this unfortunate position when a pike swam up to him and said: "*Excuse me, old boy, but do you know you're the wrong way up? Cummalonga me and I'll soon have you right!*"—and he swam away with Phineas following in his wake . . . still upside down.

After a while, they came to a place where the river bank shelved. The pike stopped and said: "*See them ants, they're eating NESTORITE Grade A.*1025 *from that used drum. Grab as many of their eggs as you can, and whether you eat 'em raw or cooked, they'll make you so Acid Resistant that you'll be able to live in a carboy of Industrial Sulphuric . . . and right way up too!*"—and off he swam to see a reed-bed about a roach.

Yes, Ferguson's NESTORITE Grade A.1025 is so Acid Resistant that it turns red Litmus sick!

YOU'RE RIGHT WITH 'NESTORITE'

JAMES FERGUSON & SONS LTD.
LEA PARK WORKS, PRINCE GEORGE'S RD., MERTON ABBEY, LONDON, S.W.19
Telephone: MITCHAM 2283 (5 LINES) *Telegrams:* NESTORIUS SOUPHONE LONDON

A. S. HARRISON & CO. PTY. LTD.,
85 Clarence St., Sydney, Australia.
120 Wakefield St., Wellington, New Zealand.
ANDRE BERJONNEAU,
134 Avenue de Villiers, Paris 17, France.
JOSE DELCLOS MOLLERA,
Angel Baixeras, 39 Barcelona (2), Spain.
EINAR HOLMARK, 19, Gl. Kongevej,
Copenhagen V, Denmark.

the NEW PLASTIFICATOR

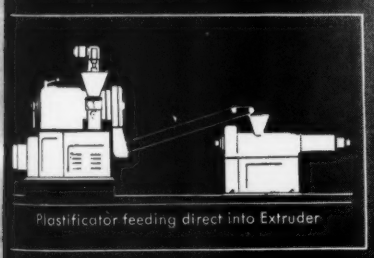
(WACKER SYSTEM)

A continuous process machine for :

GELLING
PLASTICISING
COMPOUNDING
GRANULATING

.... all types of Polyvinyl materials, particularly suitable for hard-to-gel PVC suspension Polymers with or without Plasticiser at a rate of up to 300 lbs per hr.

Please ask for illustrated brochure giving further particulars,



Plastificator feeding direct into Extruder

Manufactured by **WERNER & PFLEIDERER** *to those standards of Design, Construction and Workmanship which have been their tradition for many years.*

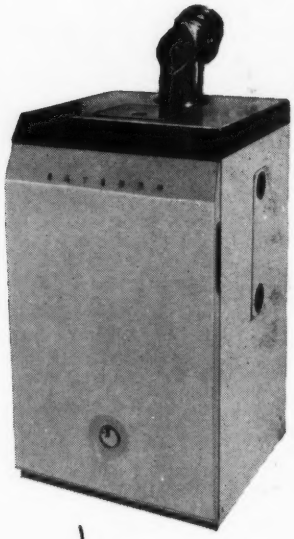
Consult

JOHN KIMBELL & CO., LTD. (PLASTICS DIVISION)

146 GROSVENOR ROAD · WESTMINSTER · LONDON · S.W.1

Telephones: TATE GALLERY 8288 *Telegrams:* JONKIMBELL, SOWEST, LONDON

RAINBOW-WP/605



that's fixed that!

58 Spire Speed Nuts are used to assemble the new Rayburn Domestic Boiler.

This is cheaper and quicker than the old method of using welded and riveted attachments in blind assembly locations—*a good deal* cheaper and quicker. Here's how they work on the Rayburn Boiler:—SNJ Nuts secure the door hinges, the door liner to the door and the panels to the frame.

SMV Grips fix the base pressing assembly and the name plate is neatly mounted with two small SFP Fixes. As we said before, Spire Speed Nuts are a lot cheaper and quicker than the old methods—for all kinds of fastening jobs.

Spire SPEED NUTS—FASTEST THINGS IN FASTENINGS

Enquiries to:

SIMMONDS AEROCESSORIES LTD.

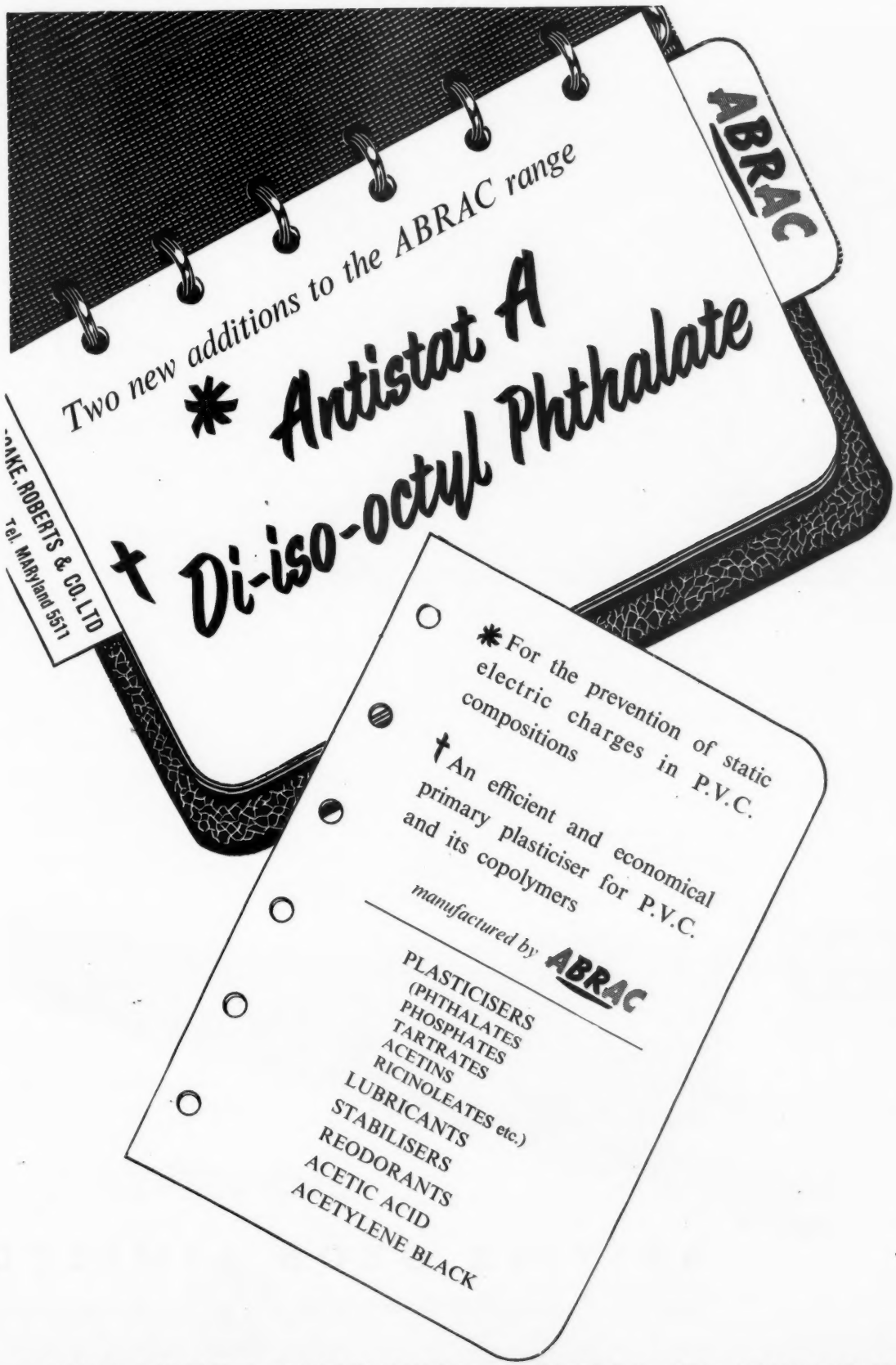
Byron House, 7-8-9 St. James's Street, London, S.W.1.

Head Office and Works: Treforest, Pontypridd, Glamorgan

Also BIRMINGHAM, STOCKHOLM, COPENHAGEN, MELBOURNE, SYDNEY, JOHANNESBURG, AMSTERDAM, MILAN & NEW YORK

A MEMBER OF THE FIRTH CLEVELAND GROUP

CRC78



A. BOAKE, ROBERTS & COMPANY LIMITED LONDON E.15 TEL: MARYLAND 5511
CAPETOWN · MADRAS · SYDNEY

GEON PVC

takes a front seat...

This two-car light-weight diesel train sets a new high standard in design, comfort and efficiency. Take the attractive well-spaced seats for example. These are protected with "Everflex" leathercloth made with Geon PVC—and will thus withstand the constant wear and tear of millions of passengers...and still retain their smart appearance. Leathercloth made with Geon PVC is extremely hardwearing and moreover possesses low flammability — an important safety consideration in modern coach design. This versatile furnishing material—it can be used as wallcovering as well!—needs only an occasional wipe with a damp cloth to keep it spotless.

Geon
Polyvinyl Materials

"Geon" is a Reg'd Trade Mark

Photographs by courtesy of British Railways

"Everflex" leathercloth produced by Bernard Wardle (Everflex) Ltd.

For more information about Geon PVC write for descriptive Booklet No. 51

BRITISH GEON LIMITED

Sales & Technical Service:

DEVONSHIRE HOUSE · PICCADILLY · LONDON W.1. TELEPHONE: MAYFAIR 8867

"GENITRON" A.Z.D.N.

This highly efficient, tested and proved blowing agent — " Genitron " A.Z.D.N. — is soluble in natural and synthetic rubber. It is sufficiently powerful to expand a rigid grade of PVC but will also produce fine uniform pores in rubber. " Genitron " A.Z.D.N. does not discolour or harm rubber, and is stable under normal storage conditions. This blowing agent is available from stock.

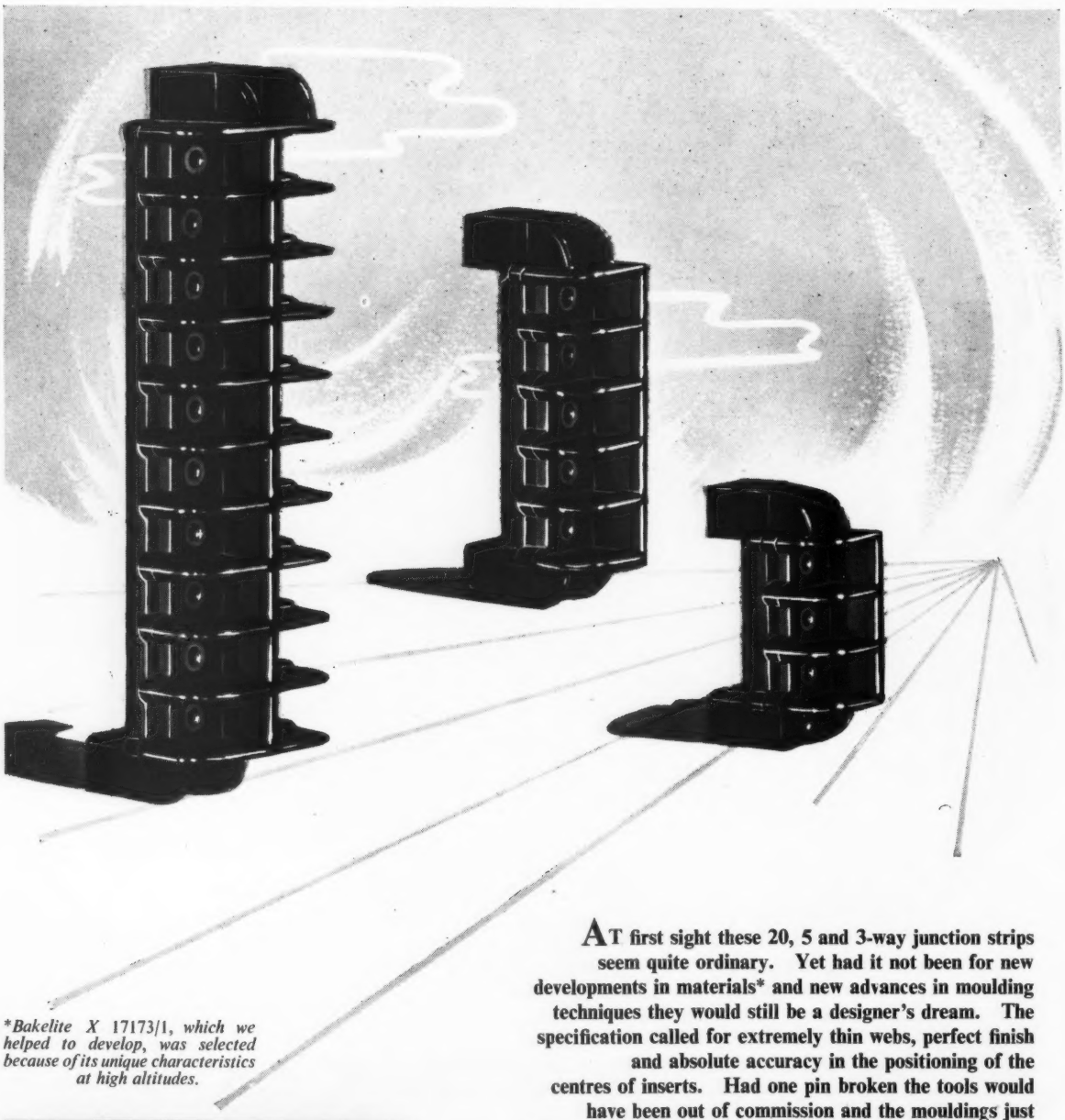
" Genitron " is the registered trade mark of Whiffen & Sons Limited

WHIFFENS

Industrial and Pharmaceutical Chemical Division of Fisons Limited

fine chemicals for industry

WHIFFEN & SONS LIMITED, DEPARTMENT Y/BA3A, NORTH WEST HOUSE, MARYLEBONE ROAD, LONDON, N.W.1. TELEPHONE: PADDINGTON 1041/9 TELEGRAMS: WHIFFEN, NORWEST, LONDON



**Bakelite X 17173/1, which we helped to develop, was selected because of its unique characteristics at high altitudes.*

AT first sight these 20, 5 and 3-way junction strips seem quite ordinary. Yet had it not been for new developments in materials* and new advances in moulding techniques they would still be a designer's dream. The specification called for extremely thin webs, perfect finish and absolute accuracy in the positioning of the centres of inserts. Had one pin broken the tools would have been out of commission and the mouldings just scrap. Like the Ordnance Depot with the sign, "Miracles we perform every day—the impossible takes a little longer," we refuse to be stumped when we are given an apparently insuperable problem to solve. If you have a problem involving compression and injection mouldings you would save a great deal of time and worry by contacting us first.

E. Elliott LIMITED

315 SUMMER LANE, BIRMINGHAM 19 Tel.: Aston Cross 1156-7-8-9

FOUR FACTORIES AT YOUR SERVICE

Walsall Works (Eldon Street)

Victoria Works, Summer Lane

Cheapside Works

Walsall Works (Bescott Crescent)

THE PLASTIC MOULDERS WITH THE ENGINEERING BACKGROUND

Fashion show puts accent on

PERMANENT PLEATS

The accent was on materials at a recent mannequin parade—held at Kendal Milne's of Manchester—when 'Everglaze' presented dresses in their new collection of fashion fabrics.

Included in the range were smooth, pleated, seersucker and embossed fabrics—and, because they were treated with Melamine resins, these fabrics will keep their effect *permanently*. Thanks to Melamine resins, they are also crease-resisting in wear, and have a matt or glossy finish that will stand up to countless washing and dry cleaning.

Not only for dresses—Melamine resins treatment of textiles, whatever their uses, gives a permanence that is far better than any previously obtained.

British Oxygen Chemicals make only the *chemical* Melamine: names and addresses of manufacturers of Melamine resins and moulding powders will be supplied with pleasure. Please write for further information to:—

British Oxygen Chemicals Limited,
Vigo Lane, Chester-le-Street, Co. Durham.
Tel: Birtley 145.
London Office: Bridgewater House,
St. James's, London, S.W.1.
Tel: Whitehall 9777.

These pleated dresses will keep their effect through countless washings.

If you have to

GRIND IT . . . SIFT IT,

MIX IT . . . . or DRY IT . . . .

talk to **GARDNERS** of Gloucester

REMEMBER POPPY DAY

GARDNERS PROCESSING PLANT IS USED IN THE MANUFACTURE OF:

PLASTICS · MOULDING POWDERS
CARBON BLACK · ASBESTOS
EARTHS CASEIN · INK POWDERS
PAINTS · CREAMS · OILS
THIN PASTES · TOBACCO PRODUCTS
RUBBER SOLUTION and many other chemical products, cosmetics, toilet products and manufactured foods.

IT might be a standard Gardner grinder, mixer, sifter or dryer. You have Britain's widest range of machines to choose from. Or it might need some special features to suit your process. It might even have to be a special job entirely. But you'll get the right machine from Gardners of Gloucester. Send in sample materials for a confidential test report and recommendations on the right machine for the job. It's the *quickest*, surest way to solve a processing problem.

GARDNERS *of Gloucester*

Wm. GARDNER & SONS (GLOUCESTER) LTD., BRISTOL ROAD, GLOUCESTER

(A subsidiary of the Gloucester Railway Carriage & Wagon Co. Ltd.)

Telephone: Gloucester 21261 *Telegrams & Cables: 'Gardner, Gloucester'*

London Office: 1 ALBEMARLE STREET, LONDON, W.1. *Telephone: Grosvenor 8206*

Moulders of the finest toys specify . . .

. . . . reprocessed
Thermoplastic moulding powders by

Polystyrene, Polythene,
Cellulose Acetate, P.V.C.

GRIST PLASTICS

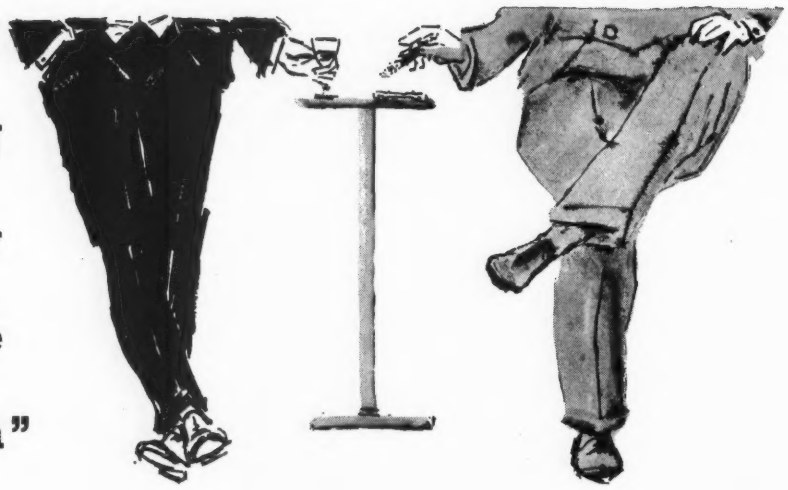
167 VICTORIA ST., LONDON, W.1
Telephone: VICtoria 1414

ONE OF THE DOHM GROUP OF COMPANIES

B

"Have you heard?..

...STYRON is now being made in Britain"



STYRON 666 is now in full production at Barry, Glamorgan. British-made STYRON* is now freely available to all. British Resin Products Ltd. — as the sole selling agents for STYRON POLYSTYRENE — welcome and will deal promptly with all enquiries about STYRON from British production.

Write for booklet 200 for further information

STYRON Polystyrene

IS MANUFACTURED BY DISTRENE LTD AND MARKETED BY BRP

SOLE SELLING AGENTS BRP

* British-made Styron materials are exported under the registered trade name Distrene.

BRITISH RESIN PRODUCTS LIMITED and DISTRENE LIMITED

2 plastics companies in the Distillers Industrial Group

SALES AND TECHNICAL SERVICE: DEVONSHIRE HOUSE · PICCADILLY · LONDON · W1 TELEPHONE: MAYFAIR 8867

Time calls

FOR
FULLY AUTOMATIC
PRODUCTION

reliable, uniformity of cycle dictated by machine, labor and operating costs cut to lowest levels

therefore

BATTENFELD

FULLY AUTOMATIC INJECTION MOULDING MACHINES

1/2 to 50 ozs. capacity

BATTENFELD MASCHINENFABRIK **MEINERZHAGEN i. WESTF.**
Germany

For particulars please apply to our agents:
Ed. Brand Ltd., 9. St. Cross Street, Hatton Garden, London E. C. 1

LARGE MODERN WORKS

THE LATEST TYPES OF PLANT

SKILLED TECHNICIANS

EVERY FACILITY FOR SERVING YOU PROMPTLY & EFFICIENTLY

Highest standards in accuracy and quality for LAMINATED PLASTIC COMPONENTS to the most exacting specifications for all INDUSTRIAL and DECORATIVE requirements

The full resources of our Technical and Experimental Departments are at your service

Send us your enquiries and prove the facts for yourself

Insulation Equipments Ltd.

TEL.: OSWESTRY 790/1 · **Oswestry, Shropshire** · 'Grams: "INSULATION"

Manufacturers of Plastic Components for all Government Departments, and approved by A.I.D. and Air Registration Board.

Kleestron
at the ready

We make Kleestron

CRYSTAL 604 — dry colourant blend

CRYSTAL 467 — extruded pellets

DS — destaticized polystyrene

H — High Impact polystyrene

STANDARD COLOUR RANGE — samples on request

SPECIAL COLOUR MATCHINGS — 48 hour service

Kleestron polystyrene is packed with the convenience of the user in mind.

Fifty pound multi-wall paper sacks of minimum dimension simplify storage—save space—stack neatly. They are intended for modern handling techniques with fork trucks and pallet trucks.

Each sack is marked with a label in the same colour as the material inside, helping selection from storage and preventing mistakes.

For export double sacks are used, for extra protection.

For D.S. material a polythene lining is used to keep out moisture.

Whatever type is inside—and wherever it goes—Kleestron polystyrene always arrives safe and sound, always at the ready.

KLEESTRON LIMITED • West Halkin House • West Halkin Street • London • SW1

. . . BIPEL Pelleters offer unmatched versatility, performance and speeds, no matter what the size or shape of the pellet or the nature of the material. The *steady squeeze* and equivalent pressures on *both* punches ensure uniform density and enable the accurate pelleting of even difficult powders. BIPEL pelleters are damage-proof, are virtually dust-free and entail a negligible powder loss. From normal materials the pellets are so strong that even the largest can safely be discharged direct into drums.

The pellets illustrated are shown actual size, *details as below:—*

- **a** 3″ dia. singly made 7-oz. pellet from G.P. Phenolic. 18 per minute on 35-ton machine.
- **b** Twin-made 1½″ x 2 ⅛″ Urea pellet of 3½ oz. 28 per minute on 70-ton machine.
- **c** 1″ dia. twin-made ½ oz. Urea pellet. 58 per minute on 12-ton machine.
- **d** 2″ dia. twin-made 3 oz. G.P. Phenolic pellet. 36 per minute on 35-ton machine.
- **e** Twin-made 1¾″ square pellet of 3 oz. from Medium Shock material. 24 per minute on 35-ton machine.

BIPEL Pelleters are made in three sizes of maximum pressures 12 *tons,* 35 *tons and* 70 *tons, giving respectively maximum strokes of* 2,100, 1,260 *and* 720 *per hour. The pellet range is from a minimum* 0.02 *oz.* (½″ *dia. pellet) on the* 12-*ton to a maximum of approximately* 18 *oz.* (4½″ *dia. pellet) on the* 70-*ton.*

BIPEL *auto-control* PRESSES

The logical complement to the BIPEL Pelleter is the BIPEL Auto-control Compression/Transfer press which can reproduce any conceivable moulding cycle at the touch of a button. Three models are available, Types 40, 100 and 200, offering together a range of variable pressures from 20 tons to 300 tons.

auto-control PRESSES *and* PELLETERS

B·I·P Engineering Limited
Streetly Works, Sutton Coldfield
Telephone: Streetly 78411

"BIPEL" is a Registered Trade Mark. World patents granted or pending.

"Couldn't the plastics people solve it?"

"You mean FRASER and GLASS"

It's amazing the things you can do—the problems you can solve—with plastics today. Fraser and Glass are the people to help you. A light, tough plastic moulding from Fraser and Glass can cut your costs, increase efficiency and help to make a product more attractive, easier to sell. Yes, Fraser and Glass have all the manufacturing ability you need; the knowledge to pick the type of plastic best suited for your problem; the experience (over 30 years of it) to ensure a successful job. If plastics can help, Fraser and Glass are the people to tell you.

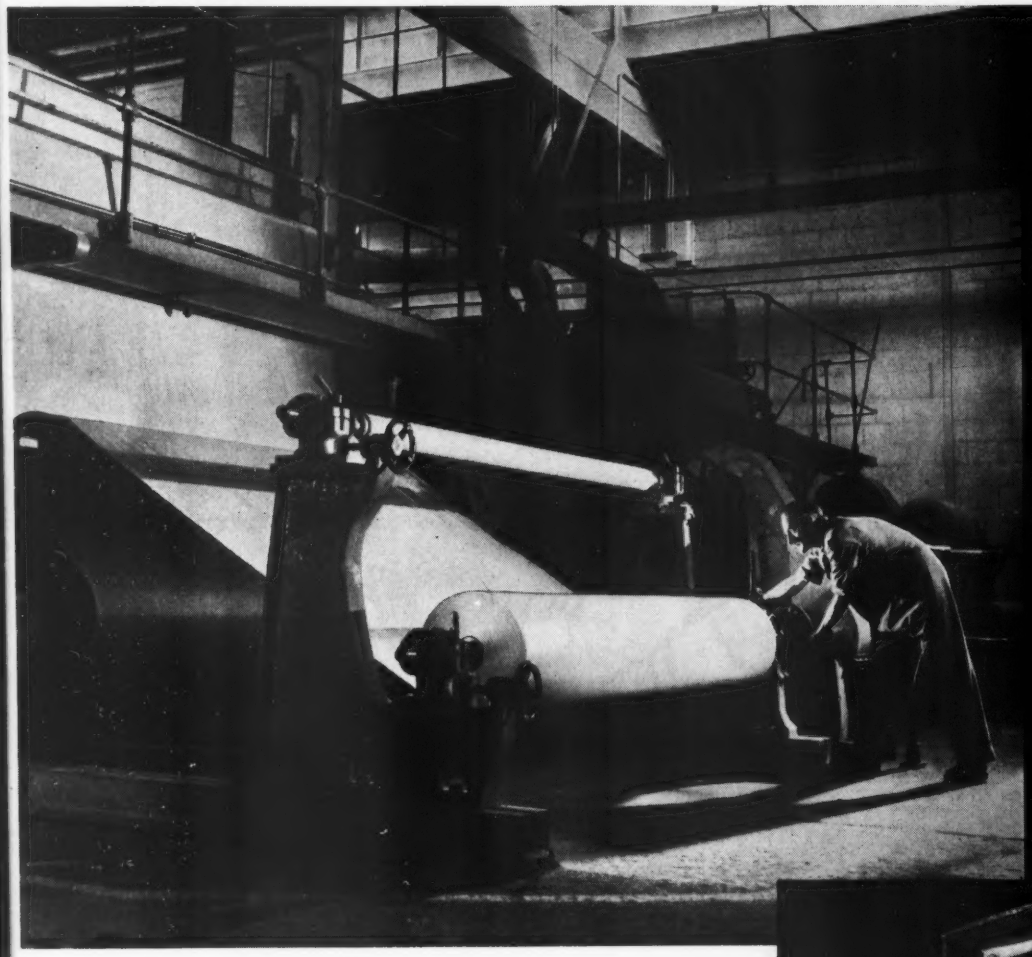
FRASER *and* GLASS

the plastics people

FRASER & GLASS LTD · WOODSIDE LANE · LONDON, N.12 · HILLSIDE 2224-5

BACKGROUND

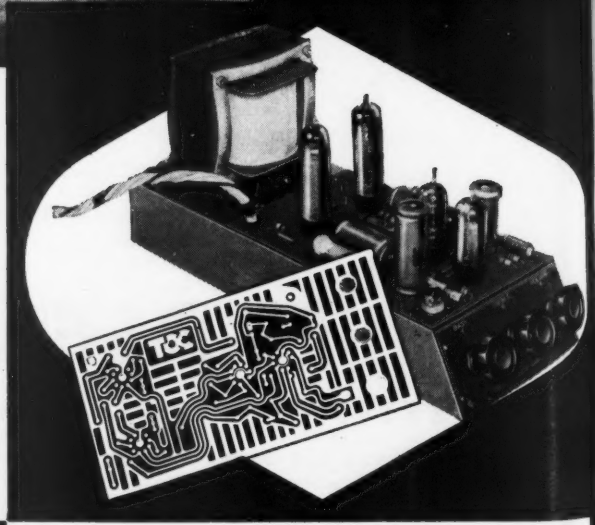
TO BETTER LAMINATES



Different properties of BAKELITE *Laminated ar emphasised in manufactu by varying the base materials. Asbestos, for example, increases heat resistance, fabric provides impact strength, and pape of various kinds are used for electrical insulation. In this photograph, paper is being reeled after passing through a large impregnator. It will subsequently be cut into sheets for laminating under heat and pressure.*

In the latest radio equipment, much conventional wiring has been eliminated and chassis assembly speeds have been doubled by using circuits etched on BAKELITE copper-surfaced Laminated Plastics. Circuits are made by printing the wiring diagram on the copper and then etching away unwanted areas. This method reduces the possibility of faulty connections, and facilitates the design of compact equipment. BAKELITE Laminated Material has many other important uses in the Radio, Electronics and Telephone Industries. Because of its excellent insulating properties and dimensional stability it is widely used for terminal strips, valve bases, parts of coils, transformers, condensers and many other components.

The original circuit for this high fidelity amplifier was designed by Mullards, and translated into a printed circuit by The Telegraph Condenser Company Ltd.



BAKELITE PLASTICS

TRADE MARK

First and still Foremost

Producers of ***Bakelite*** *Laminated Sheet, Rod & Tube ·* ***Bakelite*** *Glass Fibre & Asbestos Laminates ·* ***Bakelite*** *Phenolic, Urea, Alkyd & Silicone Moulding Materials ·* ***Bakelite*** *Polyester Resins ·* ***Bakelite*** *Phenolic & Urea Resins, Cements & Adhesives · Vybak PVC Moulding & Extrusion Compounds Vybak Rigid & Flexible PVC Sheet · Warerite Decorative Laminated Plastics*

Plastics

DEALING WITH THE MANUFACTURE, USES AND POTENTIALITIES OF PLASTIC MATERIALS

PROPRIETORS: TEMPLE PRESS LIMITED

CHAIRMAN and MANAGING DIRECTOR: ROLAND E. DANGERFIELD

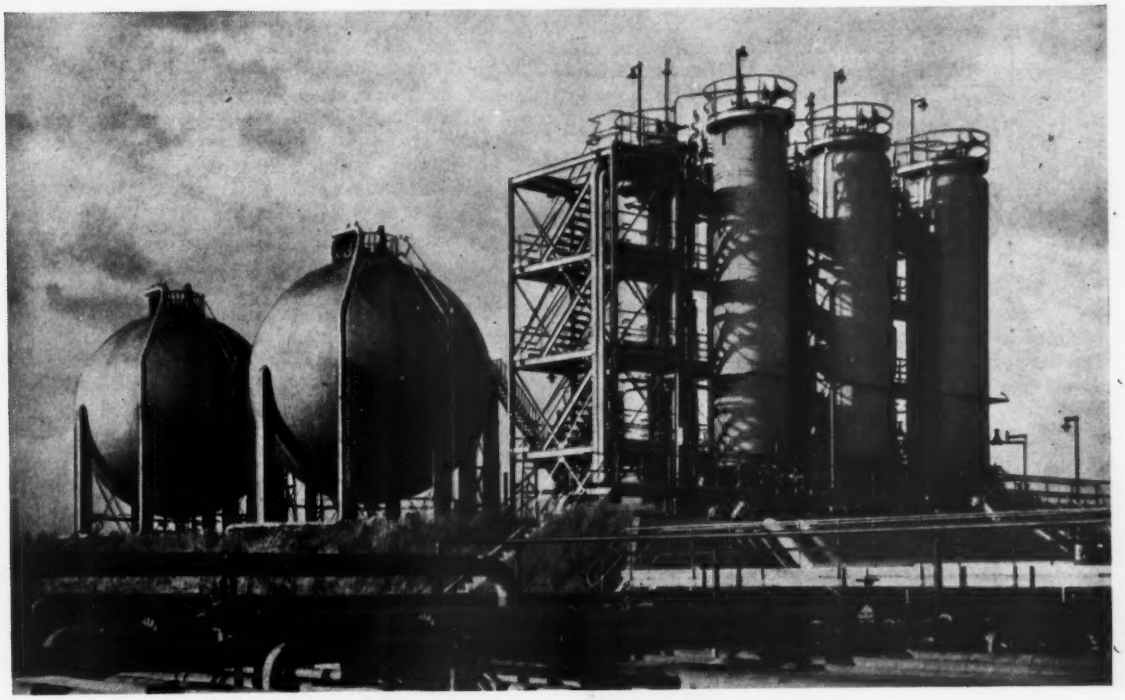
CONTENTS

	Page
Editorials	331
Moulding Powder and Shot	332
Epoxy Resin Manufacture at Stanlow	333
Reinforced Plastics from Cellulose Fibres	336
Reinforced Polyester Caravan Body	338
Plastics in the Service of Man	340
World's Industry Employs Plastics	343
Letters to the Editor	344
The Farnborough Show 1955	345
Design Centre Preview	348
Engineering, Marine and Welding Exhibition	349
Cutting Woven Synthetic Fabrics	352
New Productions	353
Plastics News	354
Talking Shop	359
Properties and Testing of Plastics Materials, Part 2 (Continued), by A. E. Lever and J. Rhys	360
Patent Review	362
Electron Microscopy	364

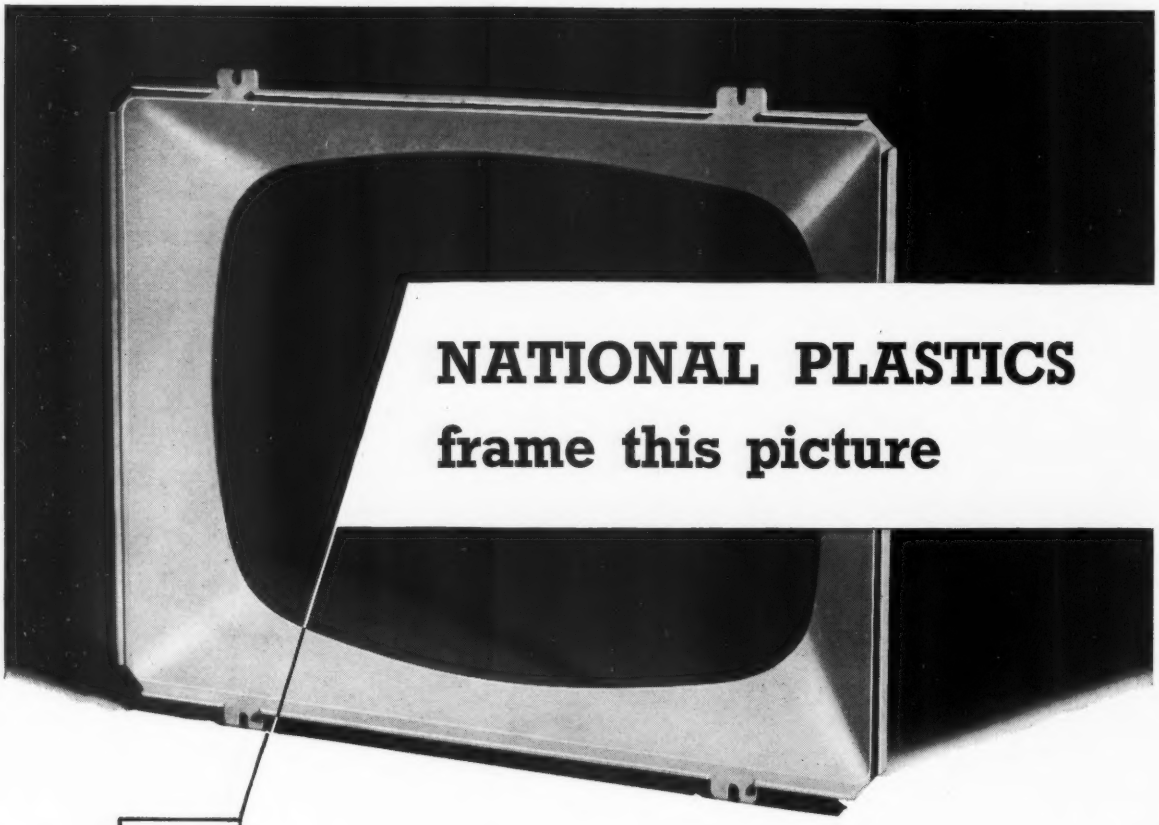
EDITOR: M. D. CURWEN, B.Sc., A.R.I.C.
ASSISTANT EDITOR: C. W. WELCH.

Printed in England and Published monthly by the Proprietors, Temple Press Limited.
Annual Subscription Rate 34/-. Shorter periods pro rata.

Editorial, Advertisement and Publishing Offices: Bowling Green Lane, London, E.C.1
Telephone: TERminus 3636



Gas storage under pressure, at the Stanlow plant of Shell.



NATIONAL PLASTICS frame this picture

Of the various methods of framing the television tube, here surely is one of the most attractive—and practical. The illustration shows the new seventeen inch tube mask now being made for Raymond Electric Ltd. by National Plastics. The mould was designed and made at our Walthamstow factory and the thermoplastic material chosen gives just the right amount of 'give' combined with faultless surface finish. Manufacturers with a plastics project in mind should ring Larkswood 2323 for practical advice and design service.

NATIONAL PLASTICS

NATIONAL PLASTICS (SALES) LTD. Sales organisation for BRITISH MOULDED PLASTICS LTD., Avenue Works, Walthamstow Avenue, London, E.4 . . . *LARkswood 2323*

NP27

Plastics

VOL. XX. No. 219 OCTOBER, 1955

EDITORIALS

Petrochemical Industry

WE recently gave vent to our enthusiasm over the news that three great companies, Imperial Chemical Industries, Ltd., Monsanto Chemicals, Ltd., and the Dunlop Rubber Co., Ltd., were laying down plant for the production of types of polymers that hitherto have not been manufactured in this country, namely, the synthetic rubbers based on butadiene, acrylonitrile and other chemical compounds. We had some time ago announced that the process of the catalytic cracking of petroleum was already installed at the works of both I.C.I. at Wilton and of Forth Chemicals (a subsidiary of Monsanto) at Grangemouth; at Wilton for the production of ethylene used in polythene and Terylene manufacture and at Grangemouth for styrene production.

Our pleasure refers to the fact that this change is a growing consummation of something we have devoutly hoped for and urged for the past 25 years—the creation of a petrochemical industry that would free us from our complete adherence to coal for so many of our chemicals and plastics.

The more or less complete absence of petroleum in these islands had confined most organic chemicals for dyestuffs, pharmaceutical and many other intermediates to coal as a source. Our solvent industry was originally based on both coal and on wood distillation, the former for benzol, toluol and xylol and derivatives from them, and the latter for acetic acid, methyl alcohol and thus formaldehyde, fusel oil, and so on. The wood distillation industry has almost entirely disappeared from the country's economy. Ethyl alcohol and its derivatives, acetic acid and anhydride and acetaldehyde, was, and still is, made entirely from molasses by fermentation. It is now happily only history that to make polythene we were forced to use ethylene produced from this ethyl alcohol. Our situation was such that to help in time of war and to avoid complete dependence on imported petroleum we were even producing petrol by the hydrogenation of coal.

Today, so far as plastics are concerned, we have now in existence a completely different picture by the erection of the aforementioned plants and less than ever do we depend on the importation of monomers and polymers. The hegemony of coal has at last been broken; and the situation gives us freer choice so far as economics are concerned.

An even more complete picture is in process of being painted. Plastics are not our whole industrial scene and plastics are not merely polymers. Numerous organic chemical products go to form our mouldable materials and are the life's blood of almost all other industries; they vary from solvents, plasticizers, catalysts, accelerators, modifying agents, oxidants, and reducing compounds, glycols, alcohols, amines, emulsifying agents, and so on. The new picture brings many of these and other new compounds into the realm of future home production from cracked petroleum gases.

In the now completed Stanlow refinery of the Shell company, which we visited last month, we can see how the modern distillation, cracking, "reforming" and petroleum chemical treating plants can give us a vastly improved freedom of action vis-à-vis coal distillation, especially since Stanlow is one of the largest and most complete of such plants in Europe. It is the largest too in Gt. Britain.

The catalytic cracker may be regarded as the key to much of the chemical production from gas oil and other heavy oils; it produces the saturated and unsaturated gases ethane and ethylene, propane and propylene and butane and butylene, and thus a great number of compounds such as ethyl, iso-propyl and butyl alcohols, ketones, glycerine, ethylene glycol, allyl chloride, butadiene, etc. From the catalytic reforming plant, benzene, toluene and the xylenes, which a few years ago could only be produced from coal, are now possible in an exceptionally pure form, that is free from sulphur.

We thus have in this and similar plants new and powerful weapons for carrying on our chemical and plastics industries in most of their aspects—for phenolic resins, polystyrene, polythene, Terylene, the synthetic rubbers and many others. Typical of the new synthetic resins, are the epoxy resins made at Stanlow from diphenylol propane and epichlorhydrin in a completely new factory which we had the pleasure of examining last month. Some details of this production are given on another page in this issue.

Production Figures

CONGRATULATIONS to Mr. T. C. Corbett for his remarkably fine and informative paper "Raw Materials in the Plastic Industry 1945-1965," given before the Plastics Institute (London Section) on September 29; our thanks also to his company, I.C.I. (Plastics Division) for permitting the disclosure of what must be the most convincingly accurate figures of Great Britain's production of plastics ever made public. What pleases us most of all is that Mr. Corbett's figures of 200,000 tons for the total production of plastics in 1954 was exactly the same as our own estimate given in the December, 1954, issue of *Plastics*. The British Plastics Federation figure announced at the Annual Luncheon in April was 250,000 tons and another gave it as 240,000 tons, figures for which we could find no sound basis.

We publish a short abstract of this paper on page 356 of this issue. The individual figures were clearly defined, and among them we discovered one on which the manufacturers must pride themselves. We refer to the extraordinary growth in post-war years of the production and use of polymethyl methacrylate, especially for the aircraft, advertising, food hygiene and television industries. Production is now at the rate of about 11,000 tons per annum.

The Future of Acetylene

DURING the past five years or so, a distinct revolution has taken place in the U.S.A. regarding the manufacture of acetylene for chemical manufacture.

Before that date all acetic acid, acetaldehyde and acetic anhydride and the monomers vinyl chloride, vinyl acetate, vinylidene chloride and vinyl alcohol were produced from acetylene made from carbide.

The vast acid and other chemical industries and, for

example, the Shawinigan group's activities also in the plastics field producing the Formvars, Butvars, Gelvas, etc., all revolve round the production of cheap electricity at Niagara Falls and the manufacture of carbide from coke.

Today the changing trend refers to the production of acetylene from the new petroleum-cracking industries with no adherence to cheap electricity nor to hydro-electric schemes. This does not mean, however, that the production of acetylene generally has diminished. Indeed, it appears to be increasing since the demand for metal welding and cutting grows steadily. On the chemical manufacturing side the picture is different because production is cheaper when made from petroleum. The actual process generally points to the partial oxidation of methane obtained in the cracking plants. A pointer regarding costs is given by the fact that while Du Pont de Nemours utilized carbide acetylene at its Waynesboro plant for making acetic anhydride it is now stated that the company purchases the chemical in the open market. *Chemical and Engineering News* also reports that Monsanto produce acrylonitrile and vinyl chloride, Carbide and Carbon Chemicals is making vinyl chloride and vinyl acetate and American Cyanamide is making acrylonitrile—all by the new cracking and oxidation processes.

In this country all vinyl monomers are presumably made from carbide made at the Kenfig plant in S. Wales or imported carbide, but the recent announcement already noted here to the effect that I.C.I., Ltd., Montanto Chemicals, Ltd., and the Dunlop Rubber Company are erecting plant for the production of synthetic rubbers, a proportion of which will be of the butadiene acrylonitrile type, may indicate a movement here also away from carbide acetylene.

In passing, we should imagine that such economic processes would make an end to any consideration of the manufacture of methane gas from sewage by fermentation. It may be remembered that this latter process was at one time considered an economical method of making the gas. All this makes one wonder if we shall ever have a more complete acetylene chemical and plastics industry in this country derived from petroleum. Such an industry was one of the noteworthy features of Germany's war-time chemical industry although it was based on coal; we know how varied it was and the number of new plastics and chemicals that were produced there and of which so little is known here. One of the most enlightening books on the subject is "Acetylene and Carbon Monoxide Chemistry," by Copenhaver and Bigelow.

Moulding Powder and Shot

If this country is in a mess over coal, France is in just as bad a one over wine, although not because of under-production. On the contrary, the growers are making far too much, the price received is far too little (24 francs a litre) and the transport costs are too high (it costs more to cart the stuff from, say the Montpelier district in the south to Paris, than they get for it). This is not the only trouble. Nobody can say that the French don't try and drink as much of it as they can themselves and do export enormous quantities, but there is so much over-production that great quantities are left on their hands. Statistics are formidable. The average production in a good year is of the order of 90 million hectolitres, which is 9,000 million litres, equal to 2,000 million gallons. Since the average alcohol content is between 9% and 11%, we may consider this to be equal to 200 million gallons of absolute alcohol! A good deal of what remains after sale as wine and spirits is converted into alcohol for industrial uses, as solvent in a hundred and one different industries and as a chemical raw material (e.g., lots go to the German synthetic rubber industries). Possibly some is used as fuel alone or admixed with petrol, but it cannot be a cheap job to get rid of 90% water in expensive copper distillation columns. But there are lashings of wine left with no buyers.

In Vino Veritas

◆ ◆ ◆

I do hope some big plastics producing company will start making expanded polyurethane in this country. I suppose all of it is imported at present but I am willing to bet that it will fast become one of the biggest demands throughout the whole world, from the point of view of personal hygiene alone. Because of its exceptional softness and texture, and the ease with which it can be washed and disinfected, it will one day be in every bathroom and used by man, woman and child. Hurry up, somebody! It's on sale in Woolworths and Gamages and many other stores in thin and thick sheets as simple rectangular-cut pieces for use as bath mats, face sponges, powder puffs, carpet underlays. Thick pieces stuck to a piece of wood serve excellently as brushes for delicate cloths since it attracts dust and dirt like anything. There must be many other general uses for it in addition to the more technical known ones of cushioning and insulation. It is far from being as strong as rubber, but is bound to be more acceptable to the public if only because of the lovely delicate pastel shades in which it can be produced, complete absence of odour and, in some cases, ease of forming.

Sponge Soft as Down

◆ ◆ ◆

A Hungarian inventor in Paris has announced that by treating textiles with silicones, shirts, suits and other wear of cotton, wool and silk will last from 10 to 20 times longer than they normally do. This statement sounds a bit exaggerated in its claims, and two or three times the present life of my "one on and one off" system would satisfy me. Moreover, my ideal shirt is one that, like nylon and Terylene, need not be sent to the laundry—I don't want it to go through those special grinding and button-tearing machines again. As a matter of fact, I don't think the idea of using silicones (probably oil-modified silicones that can be cured after impregnation) is quite new. Certainly paper has been so treated to produce non-sticking packaging of foods and, I believe, of sweets. So there is hope for me when I get my shirt stained with Brown Windsor soup, Boudin Noir à l'Extrudeuse and Crême de Menthe at the next Federation dinner.

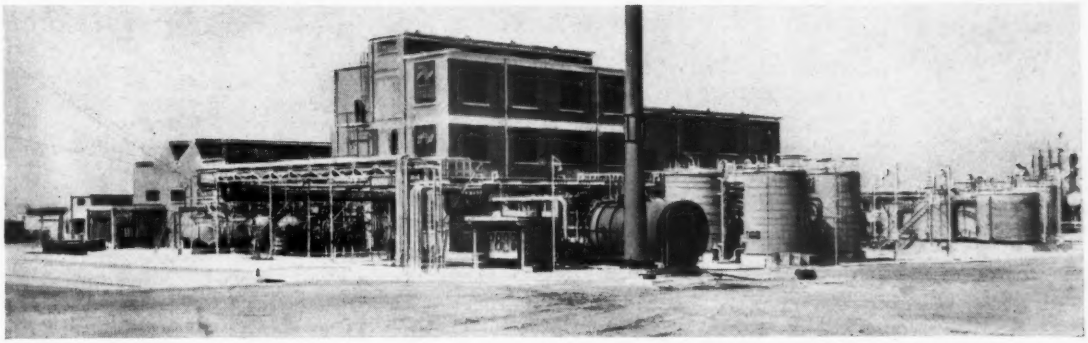
Out! Damned Spot

◆ ◆ ◆

Do you know Mr. E. B. White of the *New Yorker*? "Everything (he kept saying) is something it isn't. And everybody is always somewhere else. Maybe it was the city, that made him feel how queer everything was and that it was something else. Maybe (he kept thinking) it was the name of the things. The names were tex and frequently koid. Or they were flex and oid or they were duroid (sani) and flexsan (duro), but everything was glass (but not quite glass) and the thing that you touched (the surface, washable, crease-resistant) was rubber, only it wasn't quite rubber and you didn't quite touch it but almost. The wall, which was glass but thrutex, turned out on being approached not to be a wall, it was something else, it was an opening or doorway—and the doorway (through which he saw himself approaching) turned out to be something else, it was a wall. . . ." Cheer up, London, we're not there yet, but we're getting on fast.

Brave New World

DOGSBODDY.



Epoxy Resin Manufacture at Stanlow

ON September 13 the newest and largest of the Shell oil refineries was opened to the technical press for the purpose of viewing the "Epikote" resin factory, the most recent of the company's installations. These condensation polymers, produced at Stanlow, Cheshire, in a variety of forms ranging from syrupy liquids to solid resins, are Shell's first entry into this field, but it is no secret that the company is interested also in the future production of polythene.

Epoxy resins were first introduced into this country during the immediate post-war years by Aero Research, Ltd., of Duxford, and present manufacture of them at Stanlow by Shell on a much greater scale (of the order of 2,000 tons per annum) is a reflection on their value on a growing scale in the fields of protective coating, bonding, and casting.

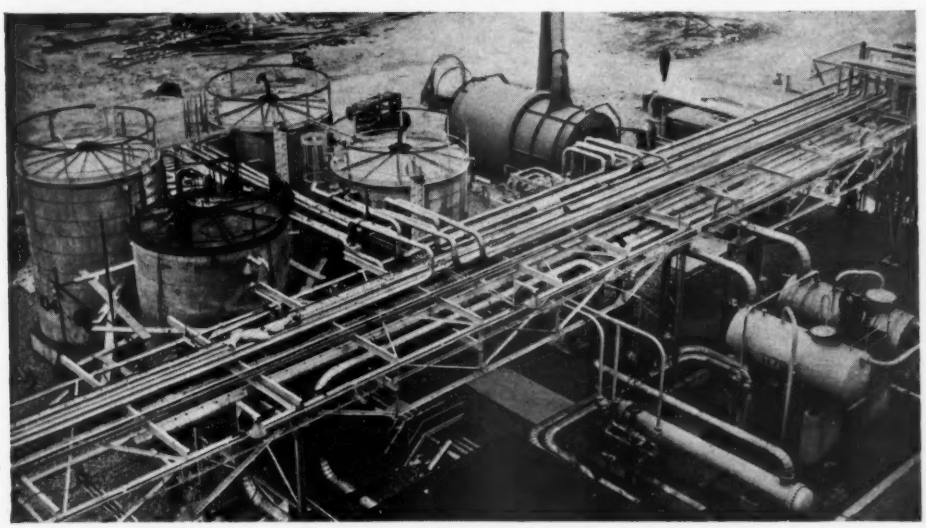
The resins are made from two hitherto comparatively rare chemicals, diphenylol propane and epichlorhydrin, the former being produced at Stanlow from phenol and acetone (made from isopropyl alcohol in the refinery), while the epichlorhydrin, at present imported, is also made from refinery gases. The condensation is carried out in the presence of caustic soda.

Production at Stanlow is designed to produce seven grades of resin liquid and solid, which differ merely in molecular weight; these differences are obtained by varying the proportions of D.P.P. and E.C.H. in the reaction, the higher the proportion of D.P.P. the longer is the chain, the change from liquid to solid taking place with the increased length.

The process resembles closely most condensations. Diphenylol is first mixed with caustic soda solution (46%) and heated with agitation. The resulting solution is then pumped into the two reacting vessels (one of which is seen on page 335) and the requisite quantity of epichlorhydrin is added. Thorough mixing of the reactants results in evolution of heat and the formation of water and sodium chloride as a supernatant solution which is drawn off. Washing of the resin with pure water continues until all traces of chloride are removed and the residual resin is then dried. If the resin is of the fluid type washing is carried out with toluene and is pumped from the reactors directly through leaf-filters and then into containers. If it is of the solid type it is maintained as a liquid and emptied from the base of the reactor through a metal filter into large, stainless steel trays where it solidifies. This resin is broken up into medium-sized lumps and passed through a crushing machine and blended.

Wherever possible the plant is equipped with controllers, which in some cases determine the temperature and control the flow of heating material accordingly, or in other cases determine automatically the acidity of the wash water and give an alarm if a certain value is exceeded. These automatic instruments allow the number of personnel employed on the plant to be kept to a minimum.

The heart of the plant are the two reactors, each of which is of all-welded stainless-steel construction. Each of the reactors is equipped with a massive anchor-type stirrer, the blades of which were cast from stainless steel, while their shafts are of mild steel clad with stainless steel. Each stirrer is driven by an 83-h.p. motor



Oil heating furnace and chemical storage tanks.

Motors and hydraulic drives for the heavy stirrers required for the epoxy resin kettles. Cleanliness is a general feature throughout the works.

coupled to the shaft by a variable-speed hydraulic drive.

The plant has been so designed that two similar reactors can be installed so that the increasing demand for these resins may be met. The wash water is introduced below the fluid resin level and is drawn off up a pipe which is controlled so that it is just below the surface of the liquid. A slight positive pressure applied to the vessel causes the wash water to rise through the "dip" pipe.

One of the reactors will normally be used for the production of liquid grades and is equipped with the reflux head arranged to remove water from the system and to return to the reactor the excess E.C.H. which is used for these grades. Solvent recovery (e.g., toluene) may be effected by reducing the pressure of the system by a vacuum set. Either reactor can be used for the production of solid grades.

Industrial applications of "Epikote" resins in the surface coatings field, which are by now well known, include coatings for the protection of domestic equipment and industrial machinery, can coatings, drum linings, tank coatings and chemical-resistant finishes for chemical plant.

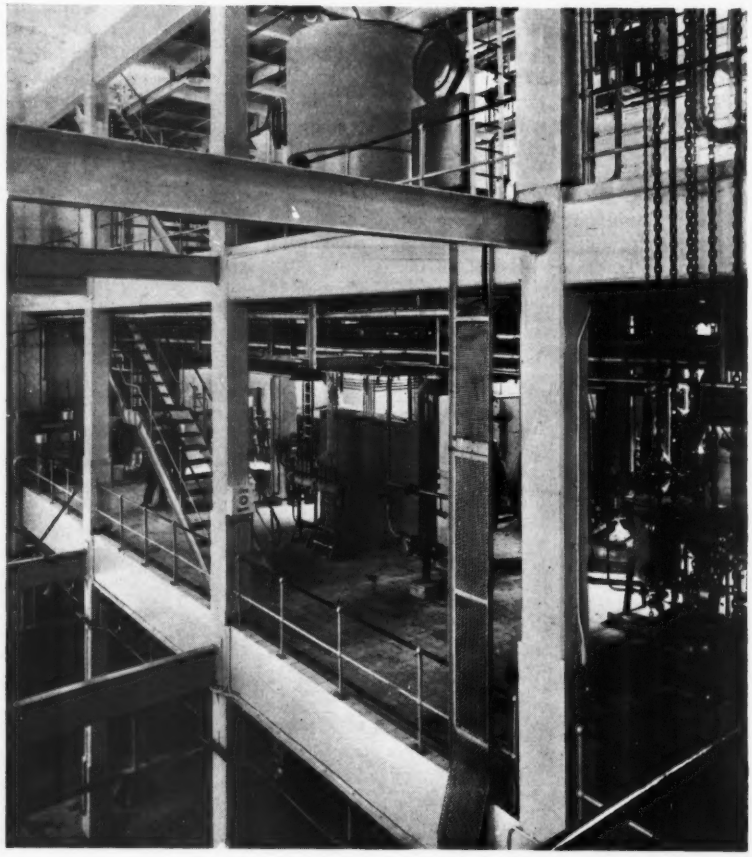
In order to obtain the film-forming properties required in a surface coating, the individual molecules must be joined to form a three-dimensional network. This "curing" is effected with cross-linking compounds such as poly-amines, phenolic or amino resins, etc., or esterification with fatty acids.

The resultant "Epikote" resin finishes have high resistance to chemical attack, due probably to the preponderance of carbon-carbon and carbon-oxygen bonds, with good adhesion and excellent flexibility.

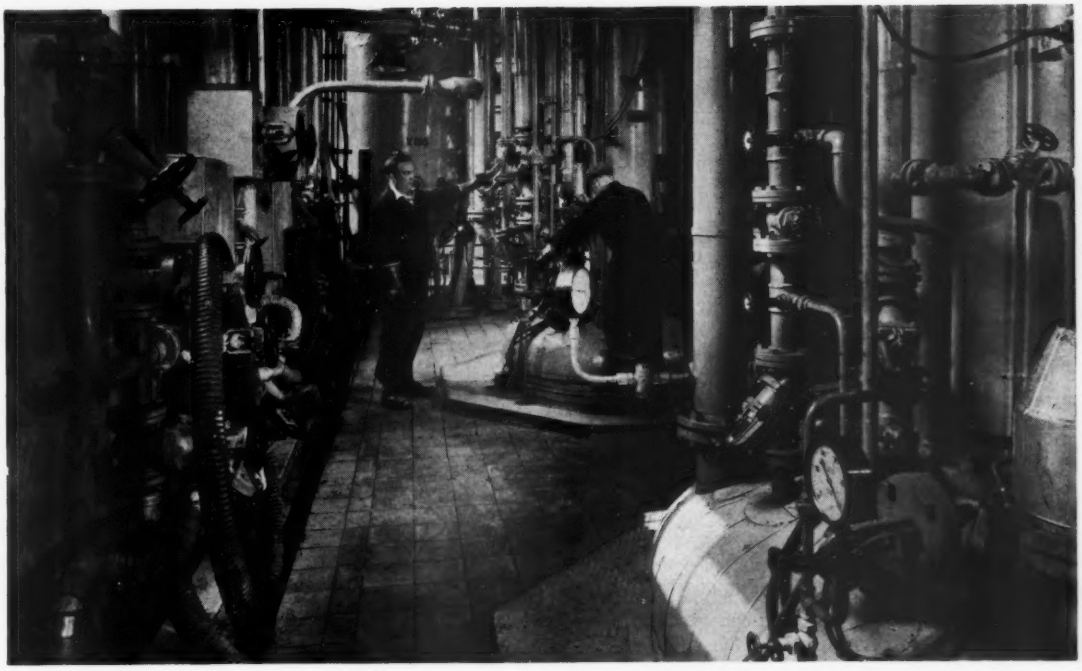
It is at once evident that these resin-based surface coatings are of special interest to chemical manufacturers, as their properties are ideal for the protection of plant from the corrosion normally encountered in this industry.

The new epoxy resin plant at Stanlow has been coated throughout with the resin-based finishes. The resin is manufactured in caustic soda solution and therefore the finishes used must be very resistant to alkali. As one of the outstanding properties of the resin finishes is their resistance towards alkaline solutions, their applications will obviously be very beneficial.

Another example of protection is at the Stanlow "Teepol" plant. During the manufacture of this detergent very corrosive



General view inside plant, showing at bottom right the reactors and instrument panel, and at top centre the weigh tank.



Operators "skimming" wash water from the reactor kettles.

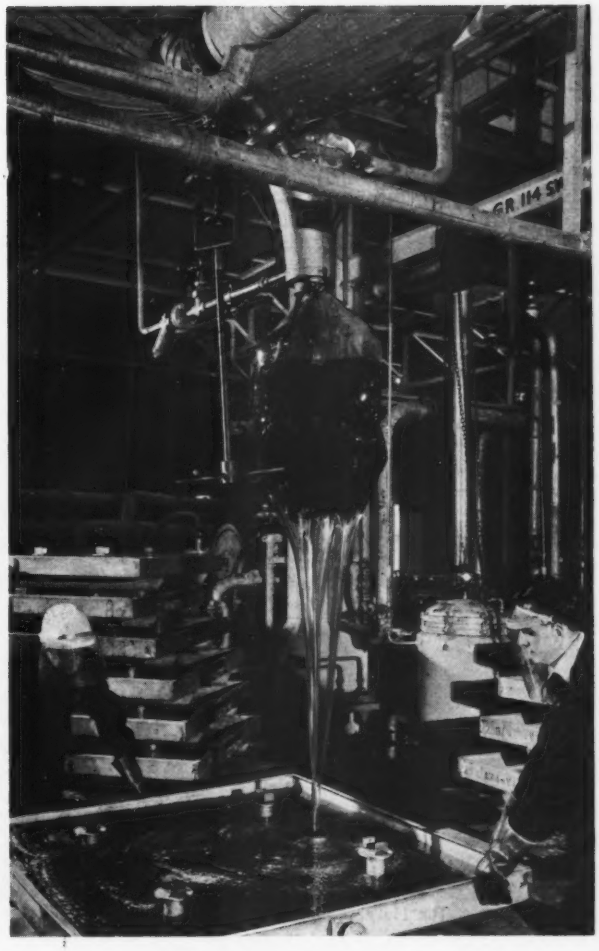
conditions are prevalent, due to the presence of olefines, sulphuric acid, moisture, etc.; for a long time corrosion was a continual problem. In October, 1954, the plant was completely stripped and recoated with "Epikote" resin-baked finishes. Since then no corrosion problems have been encountered in this plant.

As the finishes used in chemical industry must principally be air-drying, either ester-based or amine-cured resin formulations are used. The latter are the more chemical-resistant and are used where exceptional corrosion is experienced. For components of chemical plant which can be stoved, e.g., pump impellers, epoxy/phenolic resin coatings are recommended.

There are a number of important uses for the resins outside the fields of surface coatings, the principal applications here being for casting and low-pressure laminating. For these purposes the low molecular weight grades of the resins are preferred and are generally cured with amine-type curing agents.

The good mechanical and electrical properties of the cast resins, together with their low shrinkage during cure, make them particularly suitable for the potting or encapsulation of electrical equipment such as transformers. Another promising outlet for the resins in the casting will be their use in the manufacture of plastic press tools; this is currently being evaluated by the laboratories.

One of the principal features of glass fibre laminates made from "Epikote" resins is their high specific strength and resistance to a wide range of chemicals. These laminates are being used for the manufacture of chemically resistant piping and tanks and, in addition, have a number of structural applications in the aircraft and electrical industries.



Resin running out on to stainless steel cooling trays.

Reinforced Plastics from Cellulose Fibres

Notes on the development of a novel range of materials suitable for low pressure moulding

PAPER technologists have long studied the fascinating possibilities offered by the incorporation of synthetic resins into paper. Very many desirable properties are theoretically obtainable by mixing, for example, during the beating stage, various resins with the cellulose fibres.

Attempts to do this have been numerous, although the number of successes on record is surprisingly low. Those familiar with paper manufacturing processes will readily appreciate the problems that are likely to be encountered by mixing a partially polymerized and sticky resin with the cellulose slurry in water.

Fibre Form Limited, Trewint Street, London, S.W.18, a company which came into existence five years ago, has largely revived much of the work that has been done before in this field, and in addition has, by original research, carried the process to the point that it may now be regarded as entirely successful. The end objective is different in that Fibre Form has set out to produce moulded articles, utilizing part of the papermakers' technology.

Plant Employed

The equipment used by the company is made up of plant used in the papermaking industry on the one hand, and plant used in the plastic-moulding industry on the other. At the factory in South London is installed a beater, or a hollander, as it is sometimes known, which provides the raw material for their process. Kraft pulp, sulphite, etc., is shredded and fed into the beater and thoroughly defibred in the water phase. Following this, a desired quantity of specially modified synthetic resin, usually phenolic, is added, together with a small quantity of pigments and dyes. The contents of the beater are then passed into the storage tanks, where they have a life of between seven to 14 days.

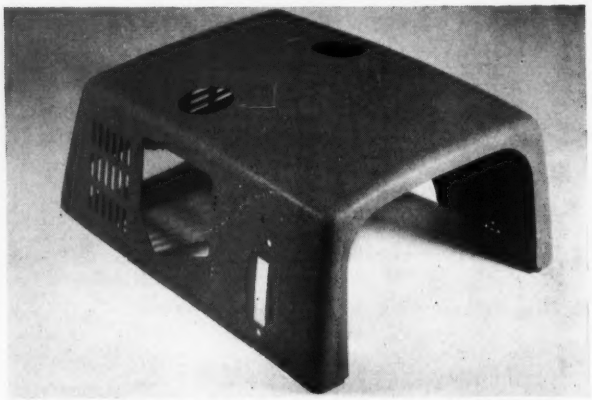
Slurry from the storage tanks is then charged, as required, into 500-gallon tanks, where it is diluted with water. The solids content of the fluid is in the order of 0.5-2%. Positioned in the tank, which is under continuous agitation by compressed air, is a preforming mould comprising a perforated surface connected to a vacuum line. By submerging the mould and applying the vacuum the random cellulose fibres are drawn on to the mould surface, and the thickness of the coating is almost entirely in direct proportion to the period of immersion. Upon removal from the bath, the preform, still containing a high proportion of water, is sufficiently strong to withstand handling. The interlocking of the individual fibres confers great strength to the structure. It is removed and passed through a drying tunnel, and on emergence has a resin content of between 15% and 40%.

The dried preforms can now be stored, and it will be appreciated that the drying process itself has advanced the cure of the phenolic resin. From the stage of virtually no cross-linking at all, the resin is moved forward to a point roughly comparable with that of the commercial moulding powder prior to moulding. The preforms are then moulded in the conventional way with matched steel dies, cure times being in the order of one to three minutes, and the only variation in moulding technique being the use of a number of lifts to permit the blowing-off of the surplus moisture. This moisture is partially residual and partially that released by the cure of the resin.

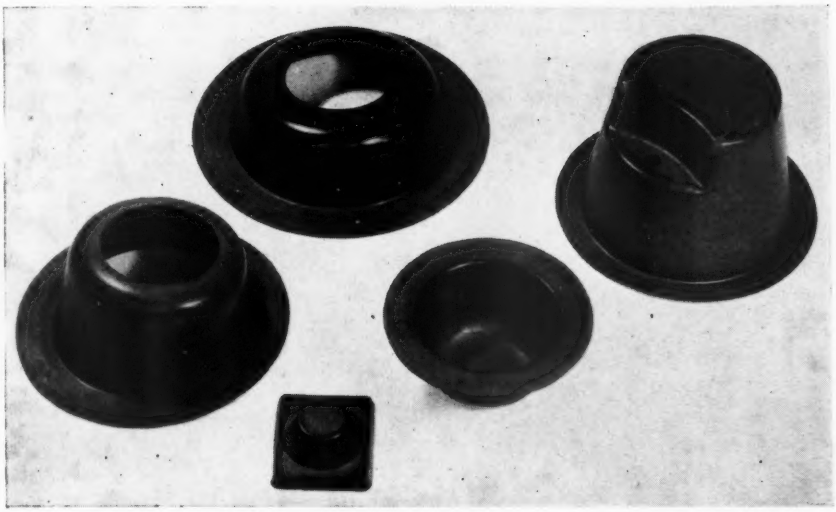
The success of this process lies in the high-strength characteristics of the moulding, coupled with lightness in weight and low cost. The percentage of resin employed is relatively small. From the mouldings already in full production it is quite evident that a substantial market is open for exploitation by the process: protectors and masks for television tubes are widely used by the radio industry; textile applications are already noted; suitcase manufacturers are interested and the company is tooling-up; the latest and most spectacular development is the moulding of a television cabinet in two halves, which was shown at the Radio Show at Earls Court this year. The television cabinet designed for a portable set has fulfilled the manufacturer's requirements, both from the standpoint of strength and saving in weight and, with a sprayed metal finish, gives eminently desirable results. The set is manufactured by Murphy Radio, Ltd., with a 12-in. tube.

In the economic aspects of this process lies the key to its future successful exploitation. On the one hand we have low-cost raw material in the form of Kraft and other cheap fibres and low-cost raw material in the form of resin used in small quantities. On the other we have a series of processes comprising beating preforming and drying before moulding

The Murphy portable television set.



A typical moulding for the Murphy cabinet.



(Left) The four large objects are television tube protectors for Philips, Murphy and Baird. The moulding at the bottom is an experimental stiffener to be used as a lens protector in a camera case.

can be carried out, processes which are not normally carried out by the conventional moulder. The plant required to carry out this process must increase as the volume of moulding carried out increases and a capital charge is therefore involved at each stage in the expansion of the company's business. We have, therefore, asked the managing director, Mr. Lewin, to prepare some notes on the balance of these two sets of conditions, and we have pleasure in publishing these herewith.

Economics of the Process

" In comparing the economic aspects of fibre-resin preform moulding with conventional moulding it is important to compare like with like. The ' Fibre Form ' technique comprises *both* the preparation of moulding composition in the shape of resin-bearing fibrous preforms and the moulding of the preforms into finished articles. Whilst it is true that as the volume of moulding increases the preforming plant has to keep pace with this increase, the same problem surely confronts the moulding-powder manufacturer, who has to increase his capacity to cope with the growth of the industry.

" Without going fully into the economic analysis of preforming versus powder manufacture, it is possible to state that in the light of my company's experience the factory cost of the preform is below the price of the moulding powder required to produce an article of equivalent strength. This differential in price increases steeply in favour of preforms as the size of the article increases.

" Further, preform moulding offers a faster curing cycle at considerably lower pressure, as the flow of the composition is not required. The moulding process merely densifies the material by compressing and bonding the interlocked fibrous structure.

" It would be pointless and misleading, however, to go into economic comparisons any further. The ' Fibre Form ' process offers very much higher strength/weight ratio than powder mouldings and thereby belongs to a different category. It is a reinforced plastic with the additional advantages of low cost and high production rate."

(Above) Case for carrying bobbins for the textile industry. This is a large moulding, 27 in. long and 18 in. wide.

(Left) On the left of the photo is a nursery tray. In the centre is a tray for carrying components in a radio factory. Beside it is a typical preform.

The Berkeley 11/14 caravan with glass-reinforced polyester body.

Reinforced Polyester Caravan Body

The first of what is hoped to be a mass-produced caravan body was shown to the general public at the Home Life Exhibition held in Leicester. Constructed in two pieces from glass-reinforced polyester resin it has effected savings in production costs and weight, with improved design and strength characteristics.

THE short history of the reinforced polyester resin has been somewhat chequered by the obscure development work for the aircraft industry and the spectacular claims which have from time to time appeared in the daily newspapers. Some of the latter have been successful and some have not, but whatever the outcome, and this applies in general to both categories, there has been little or no consistent or continuous large-scale production of one item. Whether the caravan, which will be described in the following paragraphs, and which it must be admitted is only a prototype, will be one of the first serious production units to be made on a mass-production scale is a question which only the future can answer. It certainly has the appearance of being such a unit, and the added advantage that the caravan body was *designed* to be produced in glass-reinforced polyester resin will further support this statement.

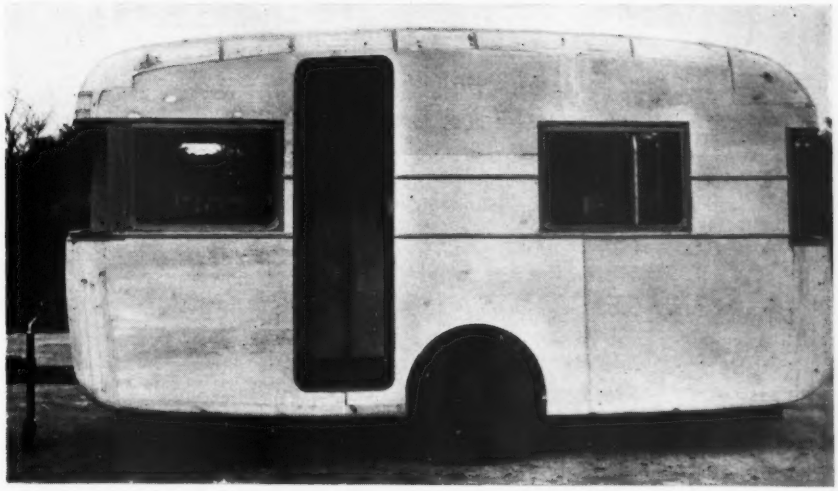
The Berkeley 11/14, made by Berkeley Coachwork Ltd., of Biggleswade, Bedfordshire, was shown to the general public for the first time by the Leicester Caravan Centre at the Home Life Exhibition. In appearance it differs only in its more modern lines from the conventional design, but in its construction it is probably unique. The bodywork is constructed entirely from polyester reinforced with glass fibre made in two sections joined by further resin and fibre down the longitudinal dividing line.

The method of moulding the halves is by the wet lay-up method in a female mould, thus giving a smooth finish to the exterior. But before this stage could be reached considerable development was necessary in order to gain the maximum benefit from the material. The manufacturers had already gained some experience in laying-up glass laminates from the production of wheel covers, roof lights and other components. A moulding of this size was, however, a different proposition, but with the aid of Bakelite Ltd. (who supply the resin) a design was drawn up and a wooden mock-up made. From this the female mould was produced complete with cut-outs for doors and windows. The doors themselves are moulded from the same material but in separate moulds.

Moulding the Body

The mould is coated with a parting agent and then sprayed with the first coat of resin, to which has been added the catalyst. This is allowed to set to a gel condition before the glass fabric is laid. Further resin is applied and worked into the fabric until the required density is obtained. In this case 50% glass to 50% resin is specified. The moulding is then

Assembling the frame of the wooden model.



The original wooden model from which the mould was finally made is shown here fitted to the chassis. The distinctive lines and large window can be clearly seen.

allowed to cure at room temperature before removal from the mould, where it is trimmed, insulating hardboard fitted and made ready for assembly to the chassis.

Chassis Assembly

While the moulding is being laid up the chassis flooring and furniture are being assembled, until just prior to the final operations the chassis appears as a flat trailer with all furnishings in position.

The two halves of the body are moved in position, fitted to the chassis and joined down the centre. No framing is necessary, except beneath the front and rear windows, which, because of the rigidity of the bodywork, have been enlarged to give more light to the interior.

Advantages

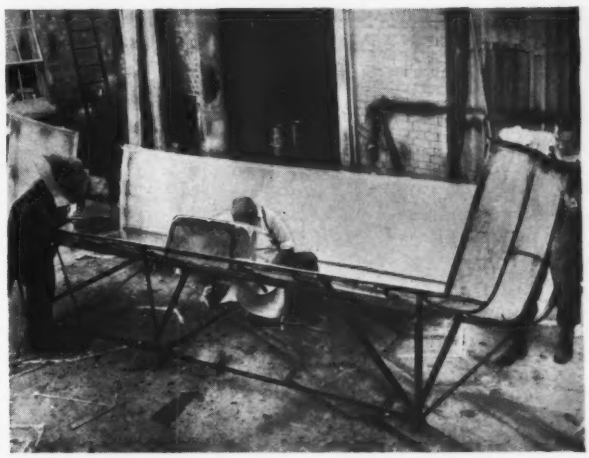
Several advantages in using glass-reinforced polyester in this application are immediately apparent. Its resistance to corrosion, self-colouring, strength, ease of repair and lightness in weight are all features which will be appreciated by the caravan enthusiasts. The saving in weight is apparent when it is taken into consideration the fact that the 14-ft. 'van weighs only 11 cwt. (and can, thus, easily be towed by an 8-h.p. car), and of this 11 cwt. the body weighs just over 1 cwt. Another factor of importance is the cost of production, which has been reduced by the use of semi-skilled labour, speed of handling and the elimination of several constructional operations which are now incorporated when laying-up the moulding. In particular, mention could be made of the lining of the door and window frames which has now been entirely eliminated. Although the design must be primarily functional, considerable latitude is now possible for the incorporation of simple exterior decoration (e.g., beading), and complex curved sections.

(Above) The final polish being given to the wooden master before preparing the mould.

Future Production

It has been mentioned earlier that this caravan body has the appearance of being a production proposition. This is further borne out by the future plans of Berkeley Coachwork Ltd., who are laying out a production line and ovens to produce bodies at the rate of one per hour. In addition, they are investigating the possibilities of this material in the production of bodies for larger caravans, using the same principles of construction.

Finally, we should like to record our thanks to the Leicester Caravan Centre and Berkeley Coachwork Ltd. for their assistance in compiling this article.



(Right) Fixing the mould to a metal trolley for ease of handling.

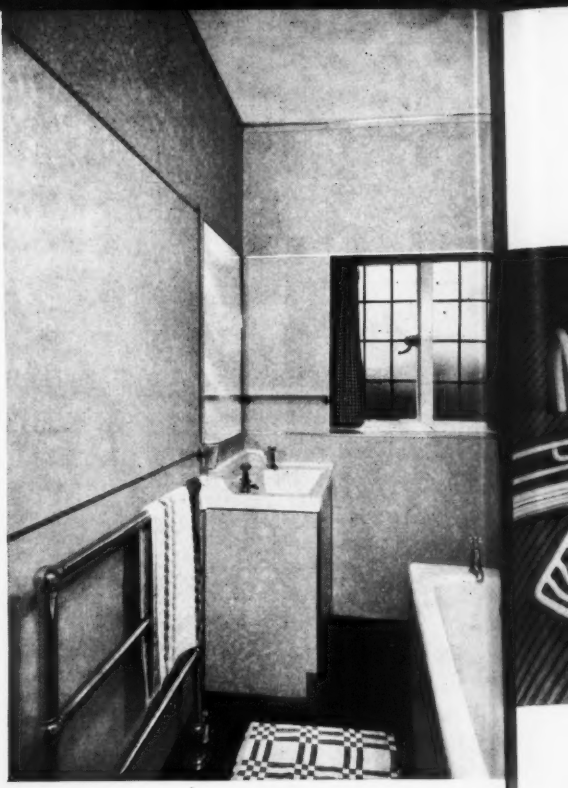
PLASTICS
IN THE SERVICE OF MAN

A pictorial review of high-quality units moulded or otherwise fabricated in Great Britain . . .

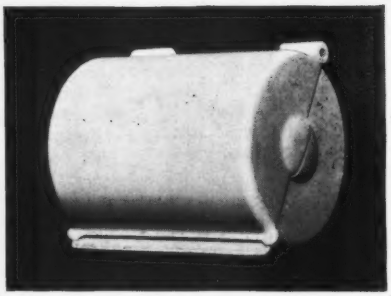
60. Plastics in the Bathroom - I

A list of trade-marks and companies mentioned in this review, with full names and addresses, appears on page 358

(Left) Toilet accessory containers made from Celastoid sheeting by Stewart Plastics Ltd. and Chiltern Paper Products Ltd. Celastoid is cellulose acetate sheet produced by British Celanese Ltd.



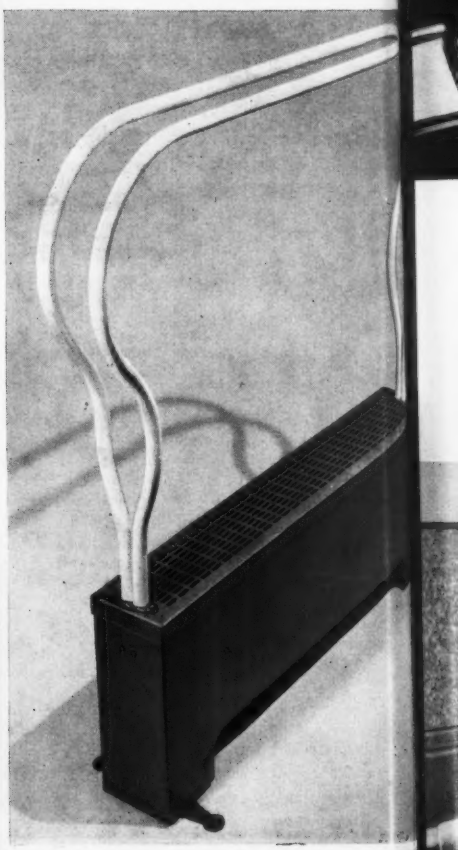
(Above) A bathroom which has been veneered in Formica with an onyx pattern.



(Above) Toilet roll holder moulded from Beetle urea powder by Brookes and Adams Ltd. (*Plastics* 1951/Oct./287.)

(Above) Bathroom veneered in Warerite with Solway Vybak p.v.c. tiles made by Hornflowa Ltd. (*Plastics* 1953/Sept./297.)

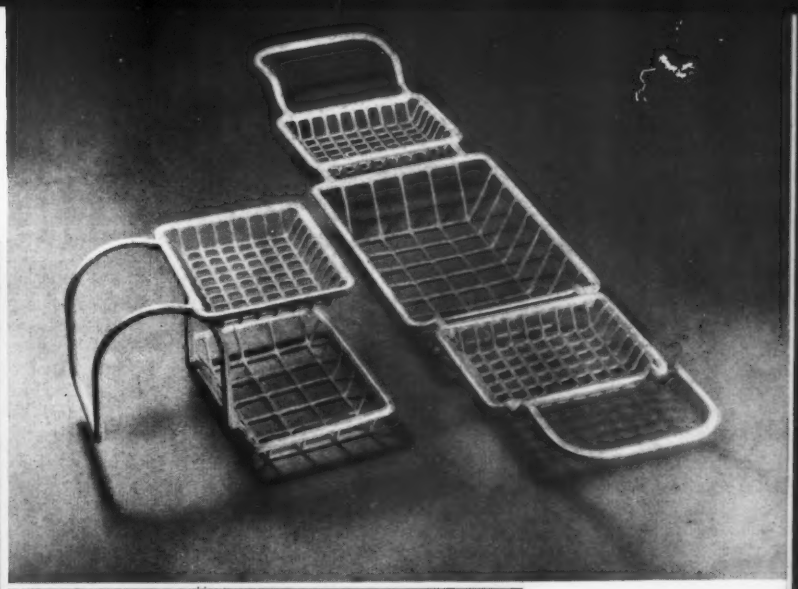
(Below) Toilet seat moulded by E. K. Cole Ltd. in Bakelite phenolic material.



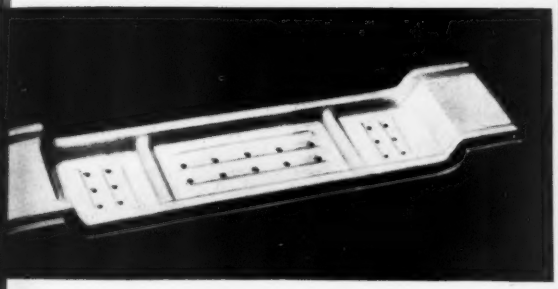
(Above) An electric towel rail, the rails of which are covered in p.v.c. by the Vietum process developed by Lacrinoid Products Ltd.

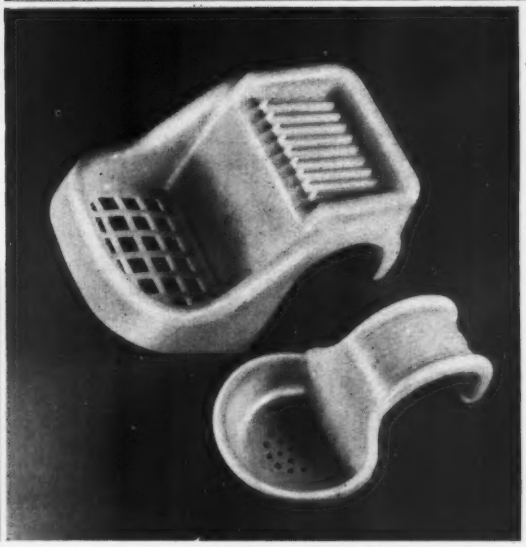
(Right) Polythene coated wire bath racks supplied by Hall and Goulding Ltd.

(Below) Soap dishes and sponge racks made in p.v.c. dip-coated wire by Smith Bros. (Wirewares) Ltd.



(Below) Bath tray moulded from Perspex sheet by Phipps Plastic Products Ltd.



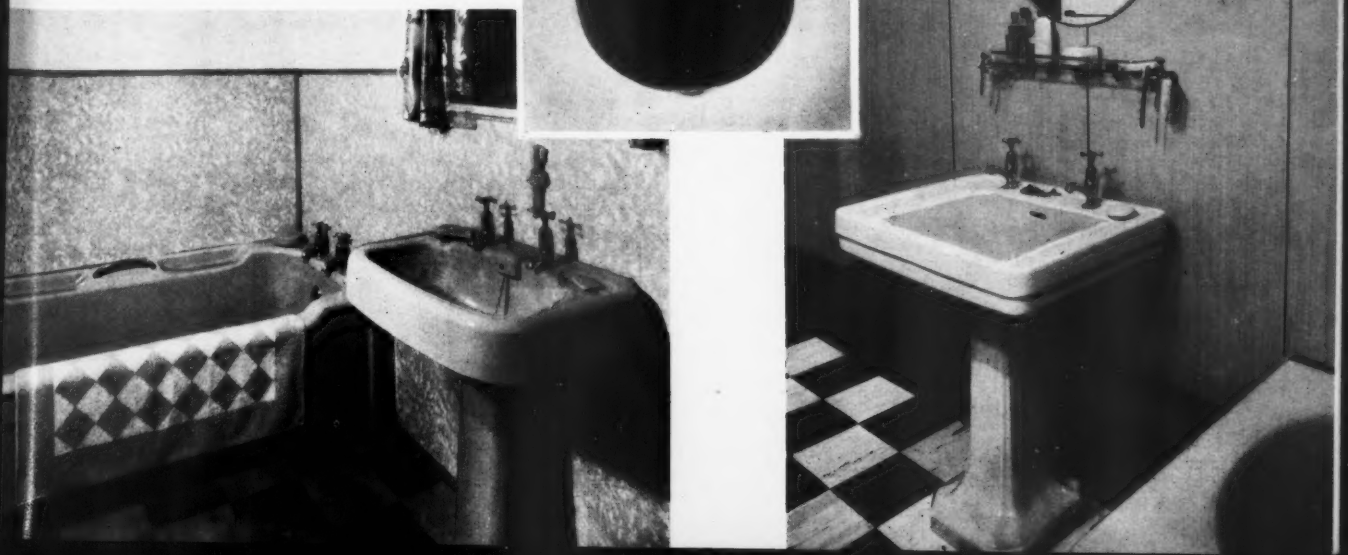


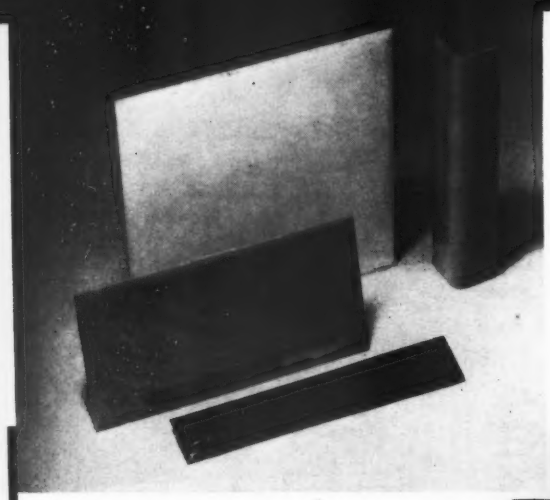
(Left) Soap dishes injection moulded in polythene by Mendle Bros. Ltd.

(Below) A further illustration of the use of Warerite veneering in the bathroom.

(Right) A seamless blown polythene cistern float developed and manufactured by Lacrinoid Products Ltd. for Associated Builders Merchants Ltd.

(Below) Formica veneering in the bathroom of a private house.





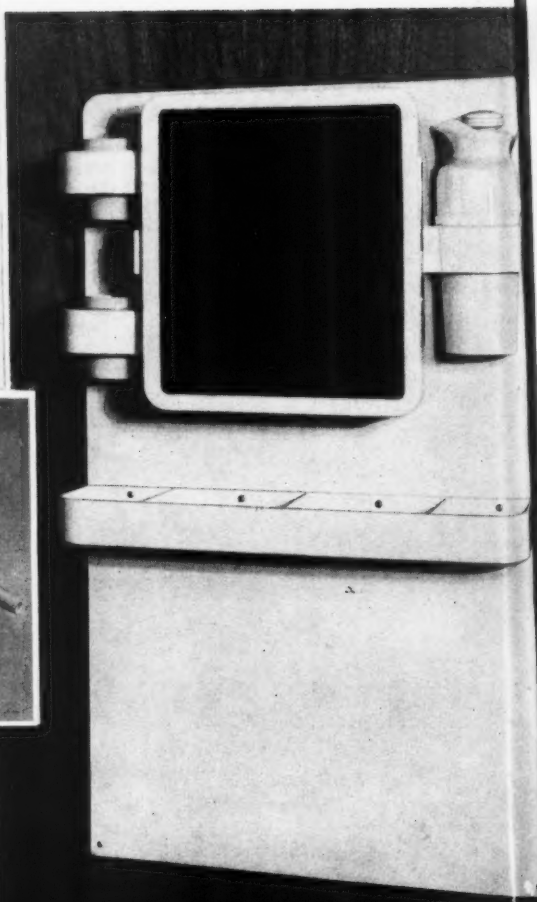
(Left) Polystyrene bathroom tiles moulded by Stone and Simmons.

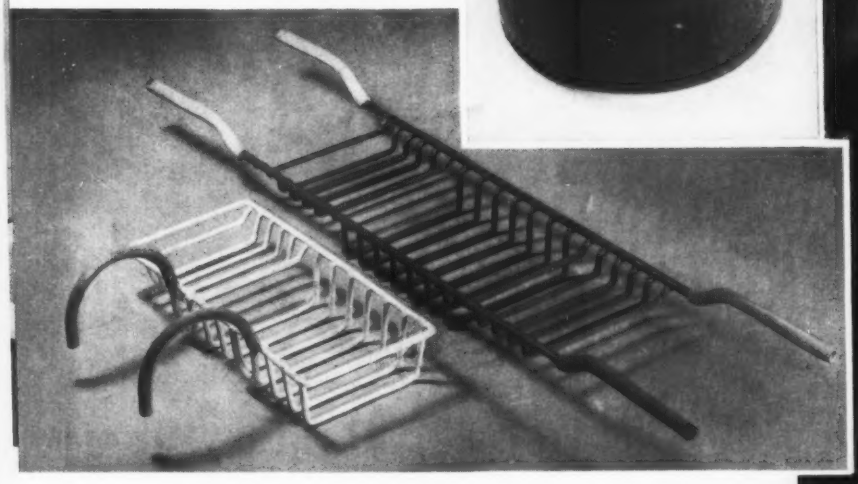
(Below) Plastic finish, asbestos base, bathroom tile produced by Plastic Finishes Ltd.

(Above) Toilet paper holder moulded in urea with a polythene back by Mendle Bros. Ltd.

(Left) Shaving brush, the grip of which is made by Halex in Xylonite.

(Right) Pan connector moulded in p.v.c. by Durable Plastics Ltd.



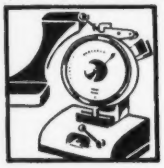


(Above) Soap and sponge dish and bath rack made by the dip-coating process. Metal Goods (Plasticised) Ltd.

(Right) Plastics basin splash-back and accessories holder for use in ship's cabins, manufactured by Roanoid Ltd.

World's Industry Employs Plastics

MATERIALS and TESTING



Amino-resins. — In admixture with various other resins, urea and melamine resin have made possible serviceable industrial finishes which are easily applied, require the minimum of processing and go far towards meeting the needs of modern mass-production techniques.
(*Electroplating and Metalfinishing*, 1955/August/287.)

Radiation stability of plastics.—Although a low exposure to high-energy radiation improves certain properties of polymers, longer exposures can produce deleterious effects. A comparison of data is given to show which organics best retain their properties.
(*Nucleonics*, 1955/July/28.)

Heat-resistant foamed silicone resin.—A report describes the production of a low-density silicone resin core material. The foams are unicellular and have excellent heat stability with low moisture absorption and good electrical properties. They are 100% solids and expanded by thermal dissociation of a blowing agent blended with the resins. None of the materials used in foaming were toxic.
(*United States Department of Commerce, Office of Technical Services*, PB111555, December, 1953.)

Stress-optical properties of Araldit-cast resins.—R. V. Baud and H. H. Raché investigated the elastic and stress-optical properties of Araldit-cast resin B at 20° and 150° C., depending on the amount of hardener (15% to 33%). At 20° C. at pure bending a change in the modulus of 7% could be effected by changing the amount of hardener.
(*Schweiz. Archiv f. angew. Wissenschaft und Technik*, 1955/August/257.)

Rigid heat-resistant polyethylenes.—A survey of new series of polyethylenes useful for pipes and fittings, housings, packages and containers, housewares, wire insulations, etc.
(*Materials and Methods*, 1955/July/88.)

Alkyd films.—The physical effects of degradation in alkyd films have been quantitatively related to the conditions and chemical mechanisms which produce them.
(*ASTM Bulletin*, 1955/July/65.)

Testing of plastic foils.—A German draft standard on determination of plastic changes after heat treatment has been published. In contrast to usual methods, a series of measurements is prescribed.
(*DIN-Mitteilungen*, 1955/July 1/294.)

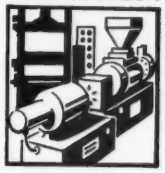
Phenolic-impregnated paper forms.—As demand grows for light, strong materials this structural material finds increased interest. Manufacture of cores and sandwich panels is described.
(*Materials and Methods*, 1955/July/98.)

Forming of phenoplasts.—T. Henne gives data on the shaping of phenoplasts under heat, such as bending, deep drawing, etc. The operations require high specific pressures and application of heat. Data on the forming of laminated materials.
(*Industrie-Anzeiger*, 1955/August 16/929.)

Mechanical properties at low temperatures.—Unexpected strength and toughness at low temperatures have been discovered in certain rigid plastics which at room temperature give only mediocre performance. Fifty-six different plastics have been investigated.
(*United States Department of Commerce, Office of Technical Service*, PB111579, May, 1954.)

Atomic radiation treatment of polymers.—Two effects observed: cross-linking of molecules to form structures of infinite molecular weight, or fracture of main chain resulting in a decrease of molecular weight and degradation from a solid to a liquid.
(*Research*, 1955/August/288.)

PROCESSES : MACHINERY



Hot-gas welding.—The processes in hot-gas welding of rigid and plasticized p.v.c. when using a welding rod are described by H. Peukert. Investigation of the influence of composition of weld rod on welding strength and establishment of most favourable working conditions.
(*Kunststoffe*, 1955/July/257.)

Vibratory conveyors have proved useful for the plastics industry owing to the absence of wear-resisting parts, not being influenced by the high temperatures of the conveyed material and efficient protection of the whole apparatus.
(*Kunststoffe*, 1955/May/194.)

Automatic temperature control of moulds.—Special devices for this purpose have been developed in collaboration with moulders and found to correspond to the practical requirements.
(*Kunststoffe*, 1955/May/213.)

INDUSTRIAL APPLICATIONS

Locking of nuts.—Results of investigations into a locking device for screw connections consisting of polyamide "Akulon" having an I-shape cross-section. The inner part is pressed from the outside into the threads; the outer part surrounds the nut. Even after loosening 50 times, the torque for unscrewing is the same as at the start.
(*VDI-Zeits.*, 1955/July 21/725.)

Determination of clouding of transparent plastics.—Recently a German Standard has been published on this subject owing to the increased use of transparent plastics for this purpose and plastics layers for laminated safety glass.
(*DIN* 53, 490, March, 1955, abstr. in *Feingeratetechnik*, 1955/July/335.)

Teflon impregnated bearings.—Porous stainless-steel bearings impregnated with Teflon are recommended for service where hot water is used for lubrication.
(*Metal Progress*, 1955/August/112.)

Sandwich produced by Marbond process.—The Marbond process gives the strongest structure at present available in relation to weight. The special adhesive is thermo-setting but contains some thermoplastics and is insoluble in all organic solvents. The production process is described in detail.
(*Automotive Industries*, 1955/July 15/62.)

Plastics in mechanical engineering.—J. Delorme gives a general survey and presents a questionnaire for the selection of suitable materials posing 24 special questions.
(*Revue Generale Méchanique*, 1955/July/219.)

Plastics pipe standard.—Work of special sub-committee organized in 1954. It is intended to establish dimensional standards.
(*ASTM Bulletin*, 1955/July/38.)

MISCELLANEOUS USES

Nylon clamps for cables. — Installation of wire bundles in inaccessible areas in aircraft have been simplified by a two-piece self-locking nylon clamp. Clamps are made in three sizes and adjustable to handle a range of wires.
(*Materials and Methods*, 1955/July/87.)

Metallized plastic films.—Deposition of metal on plastic sheet by vacuum evaporation method gives new materials with excellent light reflectivity and useful combinations of electrical and heat conductivity.
(*Product Engineering*, 1955/August/182.)

Plastics truck body.—Design changes from prototype door-to-door delivery truck of polyester resins resulted in setting up a complete vacuum bag moulding line which produces one truck per day.
(*Automotive Industries*, 1955/July 15/98.)

Plastics for office organization.—Plastics give new possibilities for rationalization and improvement of organizational aids in the office. A number of examples on the use of plastics for this purpose are given.
(*Kunststoffe*, 1955/May/209.)

LETTERS TO THE EDITOR

Correspondents are reminded that a stamped and addressed envelope should be enclosed in all cases where a personal answer is desired. It is understood that any letter received may be published at the discretion of the Editor.

Coating Metal Rods

SIR,—We are wondering if you could put us in touch with manufacturers of either liquid or small-diameter ($\frac{1}{8}$-in. bore) polythene tubing. We want to coat small metal rods approximately 1 in. long. These are to be used in connection with our magnetic stirrers. At the moment we are using glass-coated indices.

VOSS INSTRUMENTS LTD.
Faraday Court,
High Street,
Maldon, Essex.

Enamel Removal

SIR,—Can you please tell me what kind of enamel is used and of any rapid method of removing surplus enamel from the surface surrounding engraved letters which has been filled with this enamel, without taking the enamel out of the letters and without blemishing the surface of the material? The material is Perspex and the letters any size up to 3 in.

J. DINGLI.
17 New Site Street,
St. Julians,
Malta.

[EDITOR'S NOTE: Unless the enamel is soluble in petroleum white spirit, which is most unlikely, we do not know of any solvent which could effect the removal of ordinary paints and enamels without injuring the plastic.]

Plastics Scrap

SIR,—Through the medium of our agents in Milan we have received an inquiry on behalf of an Italian importer who is anxious to contact exporters of plastics scrap from Great Britain.

W. H. MARTIN LTD.
3 and 4 Rangoon Street,
London, E.C.3.

Sink Units

SIR,—Can you put us in touch with a British manufacturer of complete sink units which are available in any plastic materials?

GLENHAM PRODUCTS LTD.
Quadrex House,
Park Lane,
London, W.1.

Plastics in Handicrafts

SIR,—At the recent Plastics Exhibition I saw some demonstrations of moulding, and as I recently encountered a small problem connected with the making of a kind of "toothed" wheel, I now wonder if this component might have been easily made by the same process. Would you, then, be good enough to let me know what equipment might be needed in order to effect such a process and whether the range of raw materials could cater for a component which would have fairly hard wear?

Perhaps, at the same time, you may care to advise me as to what apparatus would be wanted for the manufacture of small pieces of domestic ornamental wear, to be carried out in the evenings by young folk who have been given instruction at their day schools.

P. G. INNS.
254 Rayners Lane,
West Harrow,
Middlesex.

Trade Name Inquiries

SIR,—We wish to get into touch with the manufacturers of the "Duchesse" brand plastic combs. Will you be good enough to let us know the name and address of the makers.

LEVETUS LTD.
194 Bishopsgate,
London, E.C.2.

SIR,—We are anxious to trace a manufacturer of plastic goods trading under the name of "Prestware."

CARDINAL MOTORS LTD.
Hythe Bridge Street,
Oxford.

SIR,—There is a thermoplastic injection-moulding material marketed in the U.S.A. under the trade name "Cycolac."

We shall be glad if you can let us have details regarding the type of this material and whether a similar material is marketed in this country.

CASTLE PRODUCTS LTD.
Morris Avenue,
Worcester.

SIR,—I am desirous of getting in touch with the manufacturers of "Kalftex" plastic material, and shall be greatly obliged if you can supply me with the address of this firm.

M. G. FOGARTY.
13-19 Guildford Street,
Chertsey, Surrey.

Golf Tees

SIR,—We are enclosing herewith a sample of a golf peg which clients of ours used to import from Canada many years ago, and they have requested quotations for 50,000 and 100,000 packed 100 in a box, printing as per sample.

We feel certain that there is a concern in this country manufacturing golf pegs of this nature, and we are wondering whether you can possibly advise us of the name and address.

F. J. HAWKES AND CO., LTD.
Finsbury Court,
Finsbury Pavement,
London, E.C.2.

[EDITOR'S NOTE: The sample was of the conventional golf tee pattern.]

P.V.C. Tubing

SIR,—We herewith beg you to kindly let us know some addresses of British manufacturers of tubes of inert chloride polyvinyl, suitable to contain soft beverages.

We require the above-mentioned for Eritrea and Ethiopia.

S. A. RAPPRESENTANZE.
Via Eleonora Duse, 7/8,
Rome, Italy.

Delta Refrigerator

SIR,—In the August issue of *Plastics*, page 293, is mentioned the Delta domestic refrigerator. Would you perhaps be good enough to let us know the name of the makers if this refrigerator is being made in the United Kingdom.

STEWART PLASTICS, LTD.
Purley Way,
Croydon,
Surrey.

[EDITOR'S NOTE: For the benefit of other readers who have made similar inquiries the distributors of the Delta refrigerator are Balmore Electrics, Ltd., 13a Old Burlington Street, London, W.1.]

Plastics Basketry Cane

SIR,—When I was in Paris recently I saw a number of shops were offering plastic "cane" for sale. The "cane" was used instead of the natural cane which is so popular here. Can you tell me where I can get supplies in this country. I believe it is hard p.v.c.

A. BOVILLE WRIGHT.
128 High Street,
Uxbridge,
Middlesex.

Plastics Grid

SIR,—I wish to make a small grid from a plastic material and wonder if same could be made from a cold setting plastic cutting out expensive tooling. True accuracy is not necessary, the grid will simply act as a trap. Could you recommend a firm who could either supply or give the information necessary.

RELIANT GLASS SUPPLIES.
147 St. Alban's Road,
Watford,
Herts.

Reinforced plastics in the nose of the Avro Vulcan—an "Aeroplane" photograph.

The Farnborough Show 1955

The plastics industry's contribution to this year's S.B.A.C. display

THE annual air display and exhibition organized by the Society of British Aircraft Constructors, perhaps because of the dramatic nature of its exhibits, has come to be regarded by both industry and the public as an event full of surprises and innovations. There is a limit, however, to the inventive genius of even Britain's aircraft industry and it, therefore, follows that on occasions Farnborough, can, to the unperceptive eye, be rather a dull affair. This year's Show may be said to fall into this category since the large majority of aircraft flown have been seen on previous occasions and since the exhibits themselves were largely developments of innovations seen in previous years. This year has, therefore, given a valuable opportunity to the visitor to take stock of the state of the industry at the moment with a mind unclouded by the excitement usually attendant upon a Show full of surprises.

The first and lasting impression to the plastics technologist was the continued and increasing use of plastics by the aircraft companies. The part that is played by Britain's plastics industry in aircraft is evidenced by the number of members of the S.B.A.C. who are also members of the British Plastics Federation. The extent of this interest may also be gauged by the quality and range of plastics exhibits at Farnborough.

The plastics industry has, over the years, benefited to an extent not realized by many, as a result of its close association with aircraft construction. In no other industry is progress made so quickly; in no other industry are specifications so rigid and exacting. This being the case the use of plastics in aircraft is subject always to extensive scrutiny and evaluation, with the result that the plastics companies participating frequently obtain information which otherwise might be denied to them. The high demands of the aircraft industry submit them also to a spirit of competition and initiative and we need only point to the reinforced plastics developments to indicate the value of flying to a progressive plastics industry.

Farnborough, therefore, provides an opportunity for an annual re-assessment of progress over a wide range of materials and for the purpose of this report we have subdivided the information obtained under the following headings: Reinforced Plastics; Moulded Components; Surface Finishes.

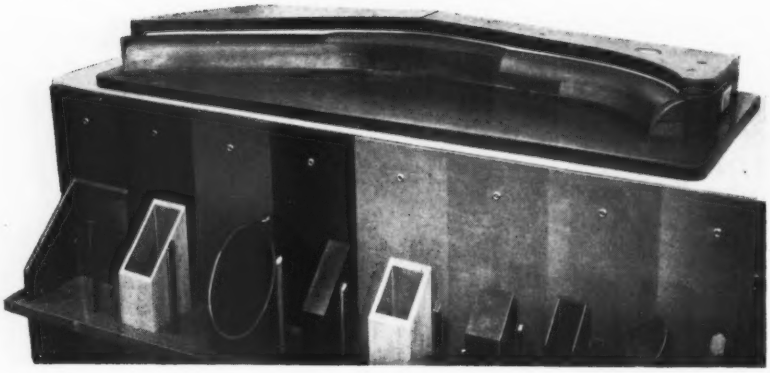
PLASTICS EXHIBITORS AT FARNBOROUGH

Aeroplastics, Ltd., 24 Bruton Street, London, W.1; Aero Research, Ltd., Duxford; Airscrew Co. and Jicwood, Ltd., Weybridge; Ashdowns, Ltd., Eccleston Works, St. Helens; B. Attewell and Sons, Ltd., Thorney Lane North, Iver; Bakelite, Ltd., 12–18 Grosvenor Gardens, London, S.W.1; Belling and Lee, Ltd., Great Cambridge Road, Enfield; R. A. Brand and Co., Ltd., Works Road, Letchworth; Bowden (Engineers), Ltd., Victoria Road, London, N.W.10; British Artid Plastics, Ltd., 361 Buckingham Avenue, Trading Estate, Slough; British Ermeto Corporation, Ltd., Beacon Works, Maidenhead; Cellon, Ltd., 380 Richmond Road, Kingston-on-Thames; Dunlop Special Products, Ltd., Fort Dunlop, Erdington, Birmingham, 24; Export Packing Service, Ltd., 56 Kingsway, London, W.C.2; Fibreglass, Ltd., Ravenhead, St. Helens; Fothergill and Harvey (Sales), Ltd., Harvester House, Peter Street, Manchester, 2; John Hall and Sons (Bristol and London), Ltd., Petherton Road, Hengrove, Knowle, Bristol, 4; Hellermann, Ltd., Tinsley Lane, Crawley; Hordern-Richmond (Sales), Ltd., Hy-du-lignum Works, Haddenham; Imperial Chemical Industries, Ltd., Plastics Division, Black Fan Road, Welwyn Garden City; Marston Excelsior, Ltd., Wobaston Road, Fordhouses, Wolverhampton; Sorbo, Ltd., Sorbo Works, Woking; Telegraph Construction and Maintenance Co., Ltd., Telcon Works, Christchurch Way, Greenwich, London, S.E.10; Thermo-Plastics, Ltd., Luton Road Works, Dunstable; Turner Brothers Asbestos Co., Ltd., Rochdale.

Reinforced Plastics

The Official Secrets Act casts a pall over any intelligent attempt to report fully on the use of reinforced plastics by the aircraft industry. The limited information available at Farnborough does, however, show that progress since 1954 has resulted in a number of new developments. Of special interest has been work by the glass fibre manufacturers in improving the types of cloth, woven roving, and chopped strand mat available and improving also the methods of treating the monofilaments with a view to increasing the strength of the resulting moulded structure.

Three glass makers were exhibiting, Turner Brothers Asbestos Co., Ltd., Fibreglass, Ltd., and Fothergill and Harvey (Sales), Ltd. These companies have adopted a



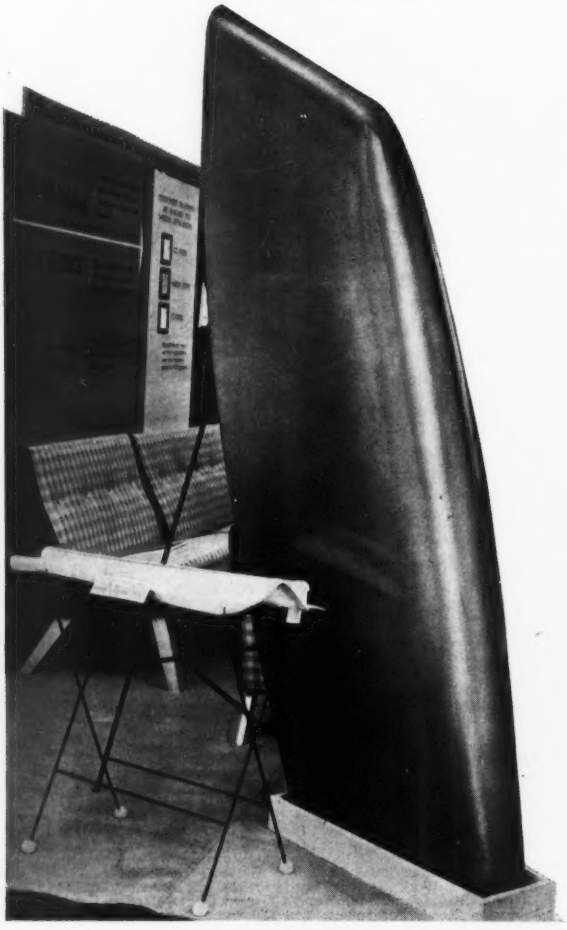
(Left) Aircraft jig on the stand of Tufnol, Ltd.

similar approach to the problem of treating the glass with a view to increasing strength. The most noteworthy is the use of vinyl trichlorsilane, with which the glass is treated after removal of the size. The effect is to increase the mechanical properties of a moulding by as much as 15%, since not only is the glass monofilament itself sealed against moisture but the trichlorsilane serves also as a chemical link between the bonding resin and the glass. No doubt there is yet a great deal of work to be done on this subject if the full potentialities of reinforced plastics are to be exploited. In the absence of sufficient data based on working tests, there are indications that the strength and ageing characteristics of reinforced plastics lag far behind the theoretical and a common field of study must obviously embrace the interface of the resin and the glass. One has the impression that much of the work at the moment is empirical, whereas the subject is of such importance that a properly organized and planned programme of study should be set in motion.

The glass manufacturers have also given close attention to the most suitable types of cloth and woven roving for the aircraft industry's needs. All three exhibitors at Farnborough were showing samples that had been evaluated by the technical staff of the R.A.E. It was surprising to find that for many purposes the woven rovings are adequate for aircraft purposes instead of the more expensive cloths.

The fabricators of these materials were represented by Ashdowns, Ltd., Marston Excelsior, Ltd., and Thermo-Plastics, Ltd., amongst others. Here the developments were limited to those parts which had previously been shown. Many people are, however, convinced that the use of reinforced plastics in aircraft is still only in its infancy and

Aircraft drop tank, fabricated in asbestos phenolic material.



Aircraft structure reinforced with glass material manufactured by Fothergill and Harvey, Ltd.

Reinforced plastics mouldings and laminates on the stand of Ashdowns, Ltd.

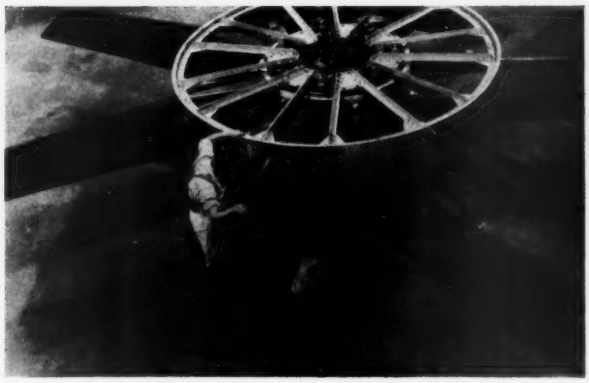
that once the materials as a whole have been accepted as suitable the volume of resins and glass absorbed will be very substantially increased. They point, for example, to bomb doors, undercarriage housings, and other structures of considerable size which remain unexploited as yet by the aircraft industry. The advantages of reinforced plastics are particularly high where complex curvatures are called for.

In the field of resins, Bakelite were the only exhibitors and showed on their stand several technical examples of the application of their products. As we have noticed in previous issues of *Plastics*, the total production of polyester resins in this country is estimated at 1,000 tons per year, a small quantity when compared with the 1954 production in the United States of 16,000 tons. Although the aircraft industry will never be able to absorb polyesters in large tonnages it nevertheless at the moment represents a significant part of manufacturers' production.

Moulded Components

A company which regulary shows a wide range of mouldings is Belling and Lee, Ltd., whose products are used in electronic, electrical and radio components and accessories. On the stand of Peto and Radford, Ltd., was shown a battery case moulded in Styron 475 by E. K. Cole, Ltd., and saving 14½ lb. in weight.

British Artid Plastics, Ltd., showed some very complicated electrical apparatus inserts of up to over 100 per moulded unit. Also shown on the company's stand was the spray unit for the Kidde carbon dioxide fire extinguisher, moulded in



Impeller for wind tunnel. Blades covered in cellulose acetate.

Glass-reinforced epoxy resin air bottle for aircraft, on the stand of Bakelite, Ltd.

black phenolic material. This moulding was excellent because of the great depth of draw called for in its production.

Hellermann, Ltd., showed examples of their mouldings of thermoplastic materials, many of which are used for water-sealing glands, pressure bungs, pressure terminals, etc.

Similar mouldings were shown by the Telegraph Construction and Maintenance Co., Ltd., using polythene.

On the stand of Thermo-Plastics, Ltd., were examples of both compression and injection mouldings and a specially attractive display panel had been arranged on which were placed 28 samples of the company's productions utilized by the aircraft industry. Low-pressure moulding was used for the manufacture of special trays in acrylic material, and cups and saucers for civil airlines were also shown.

The stand of I.C.I.'s plastics division concentrated on the use of moulded and fabricated p.t.f.e.

Surface Coatings

Cellon, Ltd., have for years specialized in the manufacture of special coatings for the aircraft industry, and these were given prominence on the company's stand. R. A. Brand and Co., Ltd., showed the use of p.v.c. in various forms for spray packaging and protective covers as did Export Packing Services, Ltd. This aspect of packaging is of the greatest importance to the aircraft industry where delicate equipment requires to be stored over a long period of time.

Also of special interest was a cellulose coating applied to the blades of a wind tunnel impeller, by the Airscrew Co., and Jicwood, Ltd. Although this application was not new, it did nevertheless indicate the strength under heavy conditions of acetate coatings of this kind.

The aircraft industry has taken a considerable interest in the use of foamed plastic materials for constructive work; a comprehensive selection of these was displayed by Jablo Plastic Industries, Ltd.; foamed polystyrene (Jablite) has a special value in refrigeration, with thermal conductivity of 0.20 B.T.U.s at mean temperatures. Other foamed materials include p.v.c. and polyurethane.

P.t.f.e. flexible tubes and pipe units were shown by Bowden (Engineers), Ltd., finding use in high-pressure flexible pipe units in aircraft, and Sorbo, Ltd., showed examples of Sorprene, polyurethane foam designed for upholstery in aircraft, amongst other applications.

Design Centre Preview

An Opportunity for British Industry

The exterior of the Design Centre, to be opened by the Council of Industrial Design in the spring of 1956.

A PRESS conference was recently held to announce the opening in the spring of 1956 of the Design Centre at 28 Haymarket, London, S.W.1. Mr. W. J. Worboys, director of I.C.I., Ltd., and chairman of the Council of Industrial Design, opened the conference by explaining the purposes of the Design Centre. He was supported on the platform by Sir Robert A. MacLean, chairman of A. F. Stoddard and Co., Ltd., and the chairman of the Scottish Committee of the Council of Industrial Design, Sir Ernest Goodale, chairman and managing director of Warner and Sons, Ltd., and chairman of the Industrial Art Committee of the Federation of British Industries, and Sir Gordon Russell, director of the Council of Industrial Design.

The Council of Industrial Design was set up in 1944, and is, in the main, Government-financed. Its brief was to promote by all practicable means an improvement in the designs of the products of British industry, its main purpose being to make them more saleable in overseas markets. The formation of the Council followed much good work in the field of industrial design by the Royal Society of Arts, the Design and Industries Association, the F.B.I. Industrial Art Committee, and by a number of enlightened firms and individuals. Nearly half the members of the Council are industrialists and the balance of the members include retailers, publicists, educationists and professional designers.

In the rather more than ten years of its existence the Council has gone some distance in fulfilling its brief, as is evidenced by the increasing number and variety of well-designed goods in the shops, and it has had some success in persuading manufacturers that good design is good business.

The Council has had considerable experience not only in organizing exhibitions but in also selecting the goods to be shown; they included "Britain Can Make It," in 1946, "Enterprise Scotland," in 1947, "Design Fair," in 1948 and 1949 and the South Bank Exhibition, in 1951. The Design Centre represents the apex of this expanding organization and will constitute a permanent but continually changing exhibition of well-designed British goods.

The Design Centre will provide a focal point at which buyers from home and overseas may see the best durable consumer goods in current production, by British industry. A convenient centre where all in search of well-designed goods may keep in touch with current trends, and where the public may look at leisure before buying in the shops. It will also distribute news and ideas in the press, radio and television.

Durable consumer goods of a high standard of design will be shown, including furniture and furnishings, textiles, radio and television, office equipment, cooking and heating equipment and travel goods.

The method of selection will be first through "Design Review," the Council of Industrial Design's sample record of well-designed consumer goods in current production. Manufacturers wishing to exhibit are urged to submit the products of which they are most proud for admission to "Design Review." Submissions are considered by a selection committee meeting weekly under the chairmanship of the director of the Council supported by a panel of Council members, two independent consultants and the Council's industrial officers. Industrial advisers have been nominated to assist this committee on trade matters and have the right of veto on technical grounds. The provision of photographs or samples is the only cost to manufacturers who have their design reviewed.

Most of the 8,000 sq. ft. of floor space in the Design Centre will be given to the permanent but changing display of British products chosen from "Design Review." To supplement this main display of goods there will be periodical and popular exhibitions, addressed to particular members of the public or to particular trades. The estimated running cost of the Centre is £80,000; and provided that a minimum of half this sum is covered by receipts, the Government has agreed, since the Design Centre will promote British trade, to match the Centre's receipts, subject to a maximum which has not yet been determined. Charges to exhibitors will be based on the size of the exhibit and the period it is on display to the public. For an average monthly display of 26 days the charge for the smallest articles, such as wrist watches or single items of tableware, would not exceed £4 per month. The charge for the largest articles, such as large furniture or refrigerators, would not exceed £10.

The foregoing information indicates very clearly that the Design Centre has only come into being after considerable thought by a large number of organizations; the need for it has emerged after 10 years' experience by the Council of Industrial Design and, properly run, it can be of the greatest value in stimulating not only the sales of well-designed British goods but also a steady rise in the level of industrial art and design. The British plastics industry has itself become increasingly aware of the importance of industrial design in any major development of its business. The recent formation of a Design Committee by the Plastics Institute, coupled with the design display at the British Plastics Exhibition, is sufficient indication of the interest by the industry in this aspect of industrial development. It is, therefore, to be hoped that the plastics industry will support the Design Centre to the fullest extent; it is certainly true to say that the plastics industry occupies a particularly favourable position in that its goods lend themselves to effective display of this kind.

An artist's impression by Roger Nicholson, of the interior of the Design Centre.

The Engineering, Marine and Welding Exhibition

This was a large and impressive exhibition and one in which many exhibits were of interest to the plastics industry. Some of these have been mentioned briefly, but readers will be able to get further information from the manufacturers whose names and addresses appear at the end of this review.

AN exhibition which covers more than a quarter of a million square feet and has over 500 stands must surely be classified as one of the more important in the "exhibitions cycle." The fields covered are, of course, large and at least some of the exhibits must be of interest to almost every industry in this country. As a "shop window" the exhibition proves conclusively that the British engineering industry still retains the craftsmanship and skill so long associated with it. The impetus to metallurgical research provided by the requirements of the jet engine, atomic reactors and other Government-sponsored projects has been and will be a benefit to all industries.

To enumerate the many exhibits which would be of interest to the plastics industry would require more space than we can justifiably give here, so comments made and articles mentioned are but a few of the many items shown at the Engineering, Marine and Welding Exhibition.

VALVES

Lubricated Plug Valves

These valves which are used extensively in pipelines for the chemical, petroleum, gas and other industries were manufactured in various metals and plastics and designed for working pressures from 5,000 p.s.i. to .001 mm. vacuum. Shown by Audley Engineering Co., Ltd.

Directional Control Valves

Three- and four-directional control valves in four bore sizes with 19 standard operating mechanisms were exhibited on the stand of Baldwin Instrument Co., Ltd.

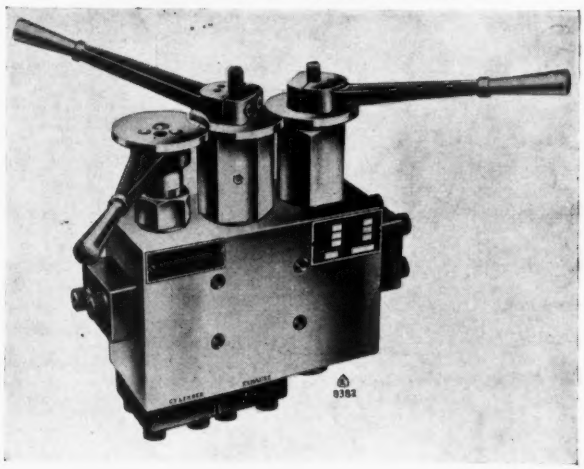
Solenoid Valves

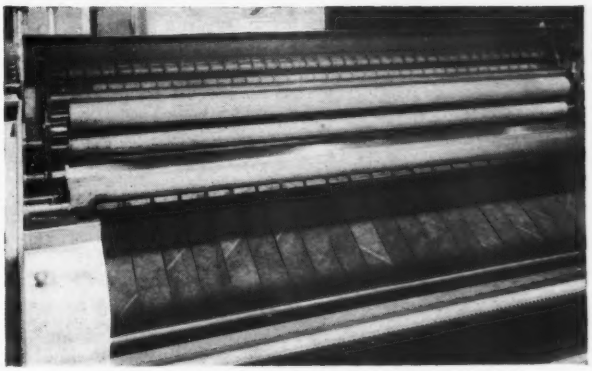
One of three new ranges of products developed by Black Automatic Controls, Ltd., were solenoid valves suitable for gas, oil, water, steam and other fluids. These valves are of glandless construction and include two-position and three-way valves.

Diaphragm Valves

Exhibited by British Arca Regulators, Ltd., were automatic control valves of the diaphragm type, together with power cylinder operated valves and electrically operated motorized valves.

A three-way valve for controlling a two-pressure up-stroking press, shown by George Ellison, Ltd.





Polystyrene and p.v.c. developing rollers on the Ilford Azoflex developing and printing machine for the reproduction of engineering drawings.

Globe Valves

Globe valves in both gun-metal and cast-iron with outside screw were shown by British Steam Specialities, Ltd.

Cast Steel Valves

Cast steel valves to withstand temperatures of up to 1,200° F. and pressures up to 600 lb. were included in the exhibits of Crane, Ltd.

Hydraulic Control Valves

Control valves for hydraulic systems with pressures up to 3,000 p.s.i., available as single or as multiple banked, and embodying unloader and relief valves, were included in the display of hydraulic equipment shown by Dowty Hydraulic Units, Ltd.

High Pressure Valves

Designed to operate at pressures from vacuum to 15,000 p.s.i. for use over a wide temperature range. The valves designed and manufactured by I. V. Pressure Controls, Ltd., have found and will find many applications in both engineering and plastics industry.

Piston Valves

Richard Klinger, Ltd., showed the Klingerflow and Klinger streamlined piston valves. These are manufactured in bronze, cast-iron and forged steel with stainless steel or other trim.

Gate Valves

Manufactured in nickel-based alloys, stainless steel and aluminium bronze, chemical valves of the gate, globe and Y types were shown on the Langley Alloys, Ltd., stand.

Needle Valves

B. Rhodes and Son, Ltd., have produced needle valves for close control with the bottom and top made in one piece, thereby avoiding leaks. A deep gland packing space is provided, and in the ½ in. and upwards size the needle clack is made to swivel to prevent seizure.

Electric Control Valves

Shown by Towler Brothers (Patents), Ltd., on their stand was a full-scale system showing the Autodraulic valves for push-button control of presses and machines using hydraulics. The system was shown operating a model down-stroking press.

STEAM TRAPS AND SIGHT GLASSES

Velan Steam Trap

Recently introduced from North America the range of Velan steam traps incorporates many new and unique

features. They were shown for the first time by British Steam Specialities, Ltd.

Impulse Steam Trap

Dewrance and Co., Ltd., included in their display of boiler mountings, valves and gauges the Dewrance-Yarway impulse steam trap.

Bradford Steam Trap

Two types of steam trap were exhibited by the United States Metallic Pattern Co., Ltd. The first one, the Bradford trap, has a positive and instantaneous action with the outlet always being submerged. The second type, the Premier trap, works on the expansion principle.

Sight Flow Indicators

A large range of sight flow indicators for chemicals, acids, water and oil were shown by B. Rhodes and Son, Ltd. These include the well-known spinner pattern and the flap pattern as well as the 3-view type.

R. and G. Flow Indicator

Included in the range of R. and G. instruments for indication and control of liquid levels and flows were the flow relays and flow indicators, manufactured by Bayham, Ltd.

TEMPERATURE CONTROL EQUIPMENT AND PROCESS TIMERS

Dial Recorders

Dial pressure gauges, dial thermometers, and other controlling instruments including temperature recorders of various types, all of which are sold under two-year-guarantee, were shown on the stand of The Accurate Recording Instrument Co.

Electronic Controls

Elcontrol, Ltd., who specialize in electronic controls for industrial processes besides a new range of photoswitches introduced just prior to this exhibition, showed process timers and cyclic timers.

Temperature Gauges

Temperature gauges of the bi-metallic and mercury-in-steel types were shown with other temperature controlling instruments by The British Rototherm Co., Ltd.

Automatic Control

Teddington Industrial Equipment, Ltd., included among their exhibits a full range of automatic control equipment for temperature, pressure and humidity regulation in heating, air conditioning, refrigeration and all types of industrial process plant.

HYDRAULIC EQUIPMENT AND AIR COMPRESSORS

Hydraulic Pumps

Gear-type hydraulic pumps incorporating pressure-balanced sealing for pressures up to 2,500 p.s.i. in a range of 14 sizes were shown on the stand of Dowty Hydraulic Units, Ltd.

Hydraulic Accumulators

Finney Presses, Ltd., exhibited the Greer-Mercia hydro-pneumatic accumulator, which is available in a variety of sizes suitable for pressures from 250 to 4,500 p.s.i. They also showed the Finney mobile power unit.

Hydraulic Valves

Shown for the first time by Keelavite Rotary Pumps and Motors, Ltd., were the new 1, 1½- and 2-in. universal valves. Each basic valve of this type may be assembled in several different ways to form a wide range of hydraulic control functions.

Gear-type Pumps

Slack and Parr, Ltd., exhibited gear-type pumps which have been used for the extrusion of hot-melt polymers and other applications which require accurate metering.

Direct Hydraulic System

Shown by Towler Brothers (Patents), Ltd., was the Electraulic direct hydraulic system, which functions without accumulators or intensifiers. High-speed, high-pressure positioning displacement pumps of 97% volumetric efficiency were also shown.

PLANT CONTROL INSTRUMENTS AND TESTING EQUIPMENT

Remote Controls

Evershed and Vignoles, Ltd., included in their remote-control equipment electronic repeaters for the indication of levels, pressure, flow and mechanical positions of industrial mechanisms.

Manometers

Pressure-indicating manometers, barometers and absolute gauges were shown by H. M. Hobson, Ltd.

Viscosity Controls

For continuously indicating, recording, or controlling viscosity, Dobbie McInnes, Ltd., had on view their Poisemeter.

Tank Gauges

Working models of hydrostatic tank gauges and controllers were a feature of the K.D.G. Instruments, Ltd., stand.

Photo-electric Units

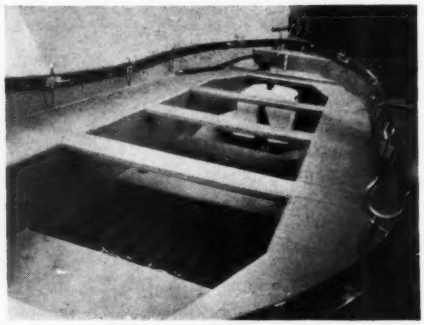
A major exhibit of Lancashire Dynamo Electronic Products, Ltd., was a fully unitized range of photo-electric switching units of a new design.

Air Gauges

Thomas Mercer, Ltd., demonstrated their well-known air-gauge equipment, which is designed for speed, accuracy and ease of operation where inspection of components to fine limits is required.

Non-destructive Testing

Apparatus and accessories for non-destructive testing using X, gamma, ultrasonic magnetic, and electronic methods were shown by Solus-Schall, Ltd.



(Above) The interior of the glass reinforced polyester lifeboat exhibited by Mechans, Ltd.

(Left) A general view of the same lifeboat. It is 24 ft. in length and certified for 40 persons.

Thermoplastic welding machines shown by Radio Heaters, Ltd., for welding p.v.c. sheet.

Metal Hardness Tester

C. Tennant, Sons, and Co., Ltd., exhibited two types of hardness tester. The first, the Penetrascope, a diamond-pyramid type; the second, the Indentometer, a Rockwell type.

Universal Testing Machines

Among the variety of testing machines shown by W. and T. Avery, Ltd., were a selection from a new range of tensile and universal testing machines and a universal impact model combining the Charpy and Izod tests.

MISCELLANY

P.V.C. Fume Fans

A special display on the stand of Keith Blackman, Ltd., was devoted to fume removal fans constructed in rigid p.v.c. These are the most recent addition to the K.B. range of products.

Pneumatic Conveyor

For use in conveying powders, granules and other anhydrous compounds the pneumatic conveyor shown by Air Control Installations, Ltd., should prove of considerable value in the handling of plastics raw materials.

Foundry Resins.

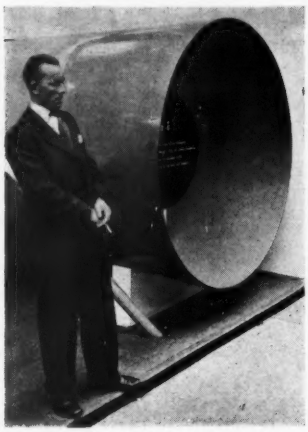
Resins for shell moulding, and other foundry applications, as well as examples of their use, were featured on the stand of Bakelite, Ltd.

X-Ray Equipment

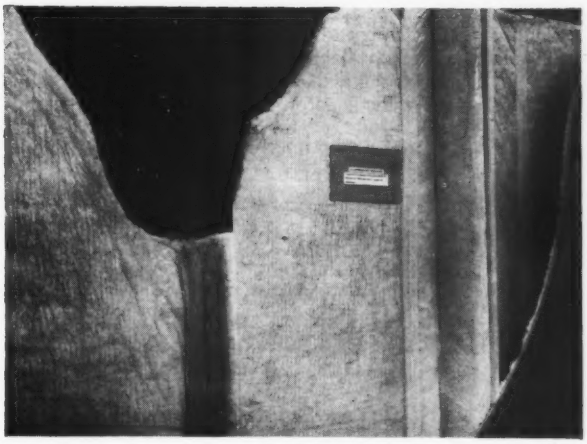
Industrial X-Ray equipment produced by Marconi Instruments, Ltd., suitable for the radiography of plastics and metals up to 3-in. thickness, was shown on this company's stand.

Plastics Lifeboat

The first lifeboat to be constructed in one piece from glass fibre reinforced polyester resin was exhibited by Mechans, Ltd. The boat is a Class B motorized lifeboat 24-ft. long with an 8-ft. beam, powered by an 8-h.p. Morris Vedette engine. It has received Ministry of Transport approval for the carrying of 40 persons. The hull has an average thickness of ¼ in. and has built-in buoyancy tanks, water tanks, food lockers and thwarts. The weight of the lifeboat with engine is 25 cwt.



Large-diameter tubing fabricated from Paxolin, resin-bonded laminate, exhibited by The Micanite and Insulators Co., Ltd.



B Fibre insulation for marine accommodation consisting of glass fibres on a p.v.c. film, shown by Fibreglass, Ltd.

P.V.C. Welding Machines

Three of the Radyne range of p.v.c. welders were shown on the stand of Radio Heaters, Ltd.; these were a portable hand welder, the model W4/L, a special version of the W4 welder with the lower electrode mounted on a projecting support and the W7/F 1 kW. general-purpose sheet welder.

Resin/asbestos Mouldings

Examples of packings, bearings and other engineering applications in Ferobestos plastics were shown by J. W. Roberts, Ltd. Ferobestos is the trade name for a resin-impregnated asbestos cloth or fibre laminate with good strength/weight ratio, temperature resistance, chemical resistance and dimensional stability. It is generally supplied in sheet, rod or tube form from which the article can be machined; or, providing a suitable contour is specified, direct moulding is possible.

Glass Fibre Insulation

Besides exhibiting examples of glass fibre reinforced mouldings Fibreglass, Ltd., showed thermal insulating sheets in slab and flexible mat form for marine applications. In the latter was " B Fibre " consisting of glass fibres of extremely small diameter bonded with resin to form a lightweight mat. This can be supplied with a heavy-grade p.v.c. film on one side to give protection against condensation. The weight of this type of mat is 0.075 lb./ft.^{2}.

Heating Ovens

Static and continuous ovens for a great many processes were shown by Controlled Heat and Air, Ltd.

Silicones

The use of silicones as parting or release agents, together with examples of mouldings in special-purpose silicone rubbers, and the use of silicones as a basis for heat-resistant paints and weld backing compounds, formed part of the exhibit of I.C.I.'s Nobel Division. Also shown were examples of ducting fabricated from plastics laminates.

Laminate Structures

Principal exhibit on the stand of The Micanite and Insulators Co., Ltd., was a tube approximately 5 ft. in diameter constructed from Paxolin phenolic resin-bonded laminate. Other exhibits illustrated the use of the company's materials in the electrical industry.

Terylene and Nylon Ropes

Among the many different varieties of ropes, cordage and hawsers shown by British Ropes, Ltd., were nylon and Terylene ropes and cloth.

Ultrasonic Drill

Mullard, Ltd., demonstrated the efficiency of their ultrasonic drill which is capable of drilling, cutting, shaping, grinding, polishing, engraving and otherwise machining the hardest materials without deformation, burning or discoloration. It will drill a hole a ¼-in. diameter and ¼-in. deep in soda glass in 30 seconds or a hole ½-in. diameter, ⅛-in. deep in tungsten carbide in 35 minutes.

Laminates for Marine Applications

The use of plastics laminates for blocks, gears, bearings and other marine applications was the theme of the Tufnol, Ltd., stand. There were, however, examples of their use in the engineering and electrical industries as well as interesting experimental applications.

One of their advantages in marine use is their non-corrosive properties.

For the benefit of our readers, we have compiled below an alphabetical list of the names and addresses of exhibitors whose products have been mentioned in this review.

Accurate Recording Instrument Co., Garth Road, Morden Surrey.
Air Control Installations, Ltd., Ruislip, Middlesex.
Audley Engineering Co., Ltd., Newport, Shropshire.
Avery, W. and T., Ltd., Soho Foundry, Birmingham, 40.
Bakelite, Ltd., 12-18 Grosvenor Gardens, London, S.W.1.
Baldwin Instrument Co., Ltd., Brooklands Works, Princes Road, Dartford, Kent.
Bayham, Ltd., 12 Lower Grosvenor Place, London, S.W.1.
Black Automatic Controls, Ltd., 159 Moor Street, Birmingham, 4.
British Arca Regulators, Ltd., 34 Millbank, London, S.W.1.
British Ropes, Ltd., Doncaster.
British Rototherm Co., Ltd., Merton Abbey, London, S.W.19.
British Steam Specialities, Ltd., Fleet Street, Leicester.
Controlled Heat and Air, Ltd., Cornwall Road, Smethwick, Birmingham, 40.
Crane, Ltd., 45-51 Leman Street, London, E.1.
Dewrance and Co., Ltd., Great Dover Street, London, S.E.1.
Dobbie McInnes, Ltd., 191-3 Broomloan Road, Glasgow, S.W.1.
Dowty Hydraulic Units, Ltd., Ashchurch, Glos.
Elcontrol, Ltd., 10 Wyndham Place, London, W.1.
Evershed and Vignoles, Ltd., Acton Lane Works, Chiswick, W.4.
Fibreglass, Ltd., Ravenhead, St. Helens, Lancs.
Finney Presses, Ltd., Berkley Street, Birmingham, 1.
Hobson, H. M., Ltd., Fordhouses, Wolverhampton.
I.V. Pressure Controllers, Ltd., 683 London Road, Isleworth, Middlesex.
Imperial Chemical Industries, Ltd., Imperial Chemical House, Millbank, London, S.W.1.
K.D.G. Instruments, Ltd., Purley Way, Corner of Mitcham Road, Croydon, Surrey.
Keelavite Rotary Pumps and Motors, Ltd., Allesley, Coventry.
Keith Blackman, Ltd., Mill Mead Road, Tottenham, London, N.17.
Klinger, Richard, Ltd., Klingerit Works, Sidcup, Kent.
Lancashire Dynamo Electronic Products, Ltd., Brereton Road, Rugeley, Staffs.
Langley Alloys, Ltd., Langley, Slough, Bucks.
Marconi Instruments, Ltd., Marconi House, Strand, W.C.2.
Mechans, Ltd., Scotstoun Iron Works, Glasgow, W.4.
Mercer, Thomas, Ltd., Eywood Road, St. Albans, Herts.
Micanite and Insulators Co., Ltd., Empire Works, Blackhorse Lane, Walthamstow, E.17.
Mullard, Ltd., Century House, Shaftesbury Avenue, W.C.2.
Radio Heaters, Ltd., Eastheath Avenue, Wokingham, Berks.
Rhodes, B. and Son., Ltd., Queen Street, Romford, Essex.
Roberts, J. W., Ltd., Midland Works, Armley, Leeds, 12.
Slack and Parr, Ltd., Kegworth, Nr. Derby.
Solus-Schall, Ltd., 18-22 New Cavendish Street, London, W.1.
Teddington Industrial Equipment, Ltd., Sunbury-on-Thames, Middlesex.
Tennant, C., Sons, and Co., Ltd., 4 Copthall Avenue, London, E.C.2.
Towler Brothers (Patents), Ltd., Electraulic Works, Rodley, Near Leeds.
Tufnol, Ltd., Perry Barr, Birmingham, 22 B.
United States Metallic Packing Co., Ltd., 4 Lloyds Avenue, E.C.3.

Cutting Woven Synthetic Fabrics

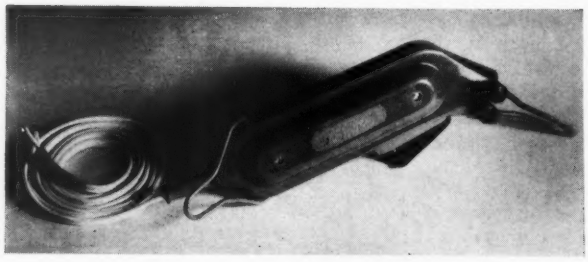
A description of a new cutting instrument which also welds the fibres and thus prevents fraying and stretching

DEVELOPED specifically for the cutting of single sheets of woven synthetic fibred materials, the K.S. electric cutter offers many advantages over scissors, guillotines and other cutting instruments. Its greatest advantage is that during the cutting operation the synthetic fibres are neatly welded, thus preventing any fraying or stretching of the selvedge and enabling points, tapers and other intricate patterns to be surely and efficiently cut out. The K.S. cutter is unsuitable for multi-layer cutting because of the tendency of the weld to join the layers together; this, however, could possibly be turned to advantage in certain applications. For prototype and development work where often the material receives rough usage and for individual orders where it is uneconomical to make special cutting forms, this machine will have a definite appeal.

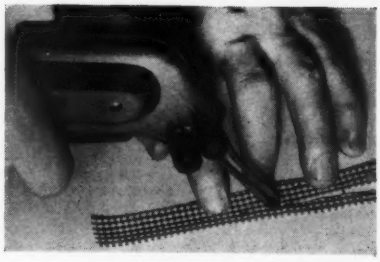
Construction

The cutter has been built so as to be easily and naturally held by the hand, control being effected by a trigger switch on the underside of the handle. The handle itself contains a transformer which, while limiting the instrument to use on A.C. power supply, guarantees an effective cutting temperature within six seconds of switching on. The cutters are supplied for use on 110, 220 and 240 volts only.

The type K.S. cutter is supplied by S. Kempner, Ltd., 29 Paddington Street (off Baker Street), London, W.1. The price is 70s. net, including stand.

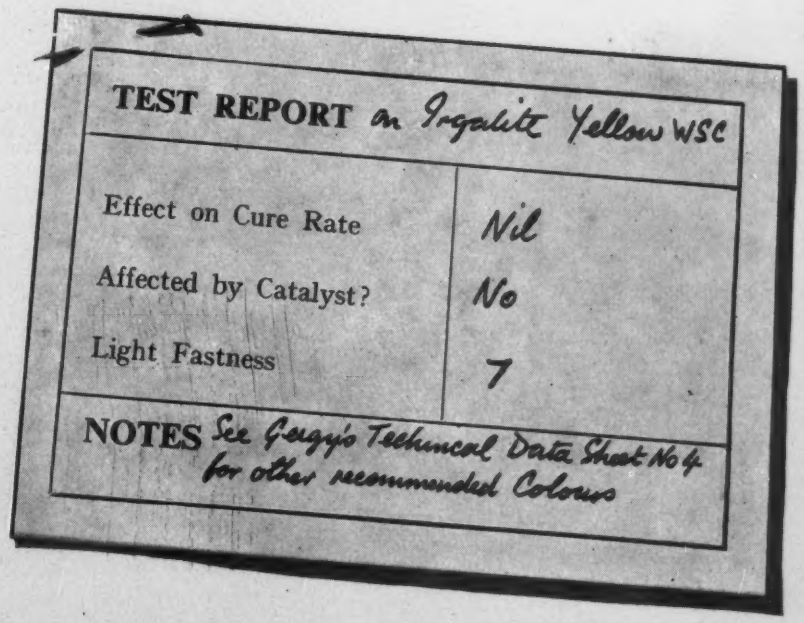


A general view of the cutter with the bit inserted. Effective cutting temperatures can be reached within six seconds.



(Right) The K.S. electric cutter in use. The welding is not obvious on this photograph but has nevertheless taken place.

Polyester Resin & Glass Fibre Colours



TEST REPORT on Irgalite Yellow WSC

Effect on Cure Rate	Nil
Affected by Catalyst?	No
Light Fastness	7

NOTES See Geigy's Technical Data Sheet No 4 for other recommended Colours

PHENOL

A high-quality synthetic product meeting the most stringent requirements of the plastics industry.

XYLENOLS

A grade of refined cresylic acid of distillation range approximately 215-230°C. Total tar acid content 99.5 to 100%.

Availability:

Ample supplies for prompt delivery in road tank-wagons and in 40/45 gallon drums.

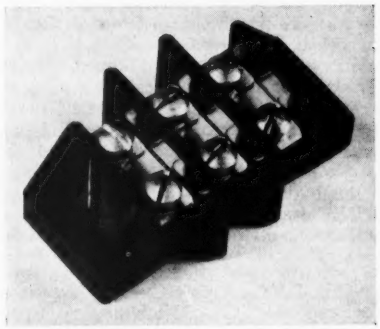
For further information, consult:

IMPERIAL CHEMICAL INDUSTRIES LTD., LONDON, S.W.1

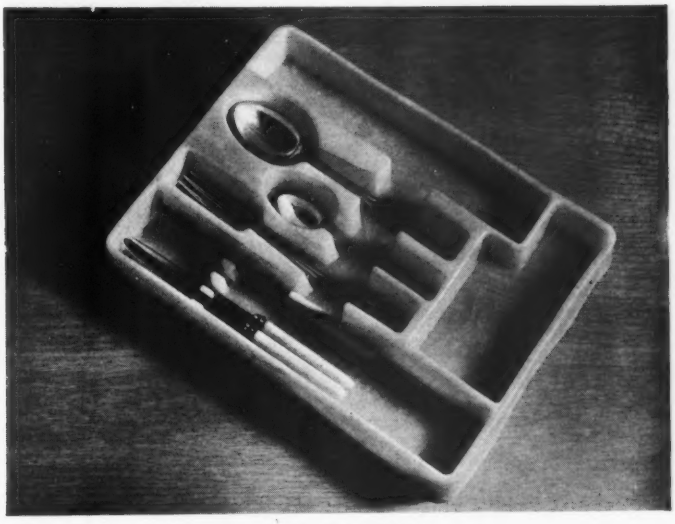
ICI

B.244

New Productions



(Above) Three-way terminal block in phenolic.



(Right) Moulded polythene cutlery stacker by Mendle Brothers Ltd.

Terminal Block

The new Kabi three-way terminal block No. DLX3 produced by Precision Components (Barnet), Ltd., 13 Byng Road, Barnet, Herts, is moulded in black phenolic material. The six terminal screws which hold the nickel-plated connection plates screw into brass inserts incorporated in the moulding. The electrical properties are a continuous current rating of 15 amperes with a breakdown voltage at R.M.S. Value 50 cycles, between terminals 7 kilovolts, and terminals to earth 11 kilovolts.

Portable Radio Battery

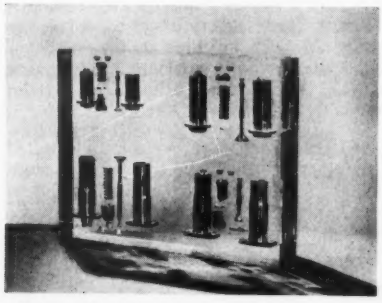
A new Exide 2-volt cell of unusual design has been evolved by Chloride Batteries, Ltd., of Clifton Junction, Swinton, Manchester, under a Ministry of Supply Development Contract.

With a nominal capacity of 20 Ah, the new cell, type ZVP19, is primarily for use with the vibrator power packs of portable radio equipment for the Armed Services. It can also be used for other similar applications and where high rate discharges with relatively high terminal voltages are required.

The cell is assembled in a robust container moulded in translucent, high-impact polystyrene. The lid, an intricate one-piece moulding in the same material, has a combined gas vent and acid trap moulded integrally with it. The moulding of the acid trap and vent in the lid itself rather than in the filling plug enables a far more efficient design of trap to be employed. A separate filling plug is moulded with a broad slot at the top so that it can be screwed up or unscrewed with a coin.

Within the cell; the nine positive and ten negative pasted plates are separated by sheets of Porvic and resin-bonded glass wool, the latter being positioned directly against the surfaces of the positives.

Filled and bench charged, the battery weighs 3 lb. and measures $3\frac{3}{4}$ in. long by $2\frac{7}{8}$ in. wide by $4\frac{7}{8}$ in. high. The charge rate is 2 amperes.



(Above) Acrylic display block.

(Left) Portable radio battery, moulded in high impact polystyrene.

(Right) Polythene tubes produced by Cascelloid, Abbey Lane, Leicester, used in the packaging of a stain remover.

Cutlery Stacker

The cutlery stacker illustrated above shows one of the many applications of plastics in the domestic market. Designed and produced by Mendle Brothers, Ltd., it provides a further addition to the already extensive Embee range of domestic articles in which this company have specialized. The material used in its construction is polythene and moulding is by the injection process, the sprue feed being in the centre of the moulding. Saving of the material on this large moulding, it measures 13 in. by $9\frac{7}{8}$ in., is effected by having hollow wall sections supported by ribbing which gives the moulding sufficient rigidity.

Display Block

Shown at the Farnborough Air Show on the stand of Wilmot Breeden, Ltd., was the display of their valves illustrated here. The four valves with their exploded parts are embedded in an acrylic block 15 in. by 10 in. by 2 in. thick. A notable feature of this display is the optical clarity of the casting which besides providing a good display medium acts as a permanent protection to the displayed goods. The embedding process was undertaken by Stanley Plastics, Ltd., formerly known as Peter Stanley.

Plastics NEWS

Raw Materials, New Plant, Works Organization, Control Apparatus, Research, Personal and Trade Notes

PHTHALIC ANHYDRIDE PLANT.—Monsanto Chemicals, Ltd., announces that it has authorized expenditure of more than £500,000 for the construction of a new plant to manufacture phthalic anhydride at its Newport, Mon, factory. The new plant is expected to be in operation towards the latter end of 1957.

Representing a very substantial addition to Monsanto's present output of phthalic anhydride, which has been manufactured at its Ruabon factory since 1936, the new plant will bring the company's total production of this chemical raw material up to some 15,000 tons yearly.

Phthalic anhydride is used in the manufacture of polyester resins; of alkyd resins used in many types of surface coatings and industrial finishes; in the manufacture of phthalic esters used as solvents, plasticizers and insect repellents; in the production of numerous pharmaceuticals and dyestuff intermediates.

It has also been announced that approval has now been given by the Ministry of Supply for the use of Lustrex Toughened 1 polystyrene in the manufacture of secondary battery containers.

The Geon compounding scale for p.v.c.

GEON LOW-TEMPERATURE COMPOUNDING SCALE.—A new aid to p.v.c. low-temperature compounding has been introduced by British Geon, Ltd. This is in the form of a handy slide rule.

If the scale is set at the low-temperature flexibility figure desired, it is possible to read off the plasticizer type and content required to give a p.v.c. compound of any desired B.S. softness number. The slide rule is based on compounds containing Geon 101 and plasticizer only.

The data used in the compilation of this slide rule (which is made of rigid Geon p.v.c.) are based on work carried out by the research department of British Geon, Ltd., with special reference to the test methods of low-temperature flexibility and B.S. softness number described in B.S. 2571, "Flexible Polyvinyl Chloride (p.v.c.) Extrusion Compounds."

NEW POLYTHENE AVAILABLE.—The new type of polythene which is being manufactured by the Ziegler process is now in large-scale pilot-plant production at the works of Farbwerke Hoechst A.G., Western Germany.

Bulk production is expected to commence at the end of this year, and development quantities of Hostalen for laboratory and factory-scale tests are now available from Hoechst Chemicals, Ltd., 27 Regent Street, London, S.W.1.

HIGH STYRENE RESINS.—Monsanto Chemicals, Ltd., announce the first products from their styrene/butadiene plant as two high styrene resins, Tred 50 and Tred 85. These two resins have been developed as reinforcing agents for use in the manufacture of resin rubber. A laboratory report on them is available from 25-27 Charles II Street, London, S.W.1, and pilot plant quantities are also available for evaluation.

GERMAN H.F. WELDING MACHINES.—The reputed firm of engineers, Paul Kiefel, Piding, Obb, who have for years solely supplied the Körting Radio Werke G.m.b.H., Grassau Chiemgau, with the prove presses for welding plastic foils, has now been converted into a limited liability company with capital of DM.180,000.

In order to meet also in the future, the constantly increasing demand for production capacity, the firm is at present erecting new works buildings in Freilassing/Obb. Associated with the expansion and extension of the programme for the production of machines and equipment for foil working the firm, abandoning the unilateral connection, has opened a sales centre in Munich —Plastik Haus, Baierbrunnerstrasse 14, the management of which is in the hands of Mr. Renz, formerly engineer in charge of the H.F. generator side of the Körting radio works.

FLUOROCARBONS. — An illustrated booklet published by Edison Swan Electric Co., Ltd., 155 Charing Cross Road, London, W.C.2, gives an illustrated account of the moulding and properties of p.t.f.e. and p.c.t.f.e.

From Crane Packaging, Ltd., of Slough, also comes two information leaflets on p.t.f.e.

REMINDER

We wish to remind readers that the editorial address of *Plastics* is now

BOWLING GREEN LANE, LONDON, E.C.1

Telephone No.: TERminus 3636

TECHNICAL BULLETIN ON ACRYLIC ESTERS.—Ethyl acrylate, n-butyl acrylate, 2-ethylbutyl acrylate and 2-ethylhexyl acrylate are described in a technical bulletin recently issued by Carbide and Carbon Chemicals Company, a division of Union Carbide and Carbon Corporation.

The new booklet covers methods of polymerization, applications of polymers and copolymers, and selected references. Physical and chemical properties, shipping data, and reactions of the acrylic esters in chemical syntheses are included. Copies of this bulletin (F-7434) are available from Carbide and Carbon Chemicals Company, 30 East 42nd Street, New York 17, New York.

NEW P.V.C. FABRIC.—The Gourock Ropework Co., of Port Glasgow, have introduced a new range of p.v.c. coated fabrics. These will be known as "Birkmyre's P.V.C. Coated Cloth" after the Birkmyre's cloth which they have made for several years. Several grades are available suitable for fine quality work or for heavy industrial applications where robust materials are essential.

RESINS HANDBOOK.—Featly Products, Ltd., Farrell Street, Manchester, 7, have issued a booklet on their resins. These include surface coating resins, moulding resins, foundry resins, laminating resins, adhesives and other resins for specialized applications.

Showing the applications of Formica in hospitals, dispensaries and surgeries at the Pharmacy Exhibition.

EPOXY RESIN ADHESIVES.—A report appearing in the latest of the Aero Research Technical Notes indicates that Araldite epoxy resin adhesive is to be sold to the general public. Two tubes will be supplied, one containing the resin and the other containing the hardener. It is expected that these tubes will soon be available from most hardware stores.

AGREEMENT.—An agreement recently made between Robertson Thain, Ltd., of Ellesmere Port; Frank Segner and Co., Ltd., of Manchester, and Bush, Beach and Gent and Co., Ltd., of London, permits these two latter companies to market those grades of "Stypol" polyester resins which are used for general laminating purposes.

"Stypol" HLT, used in the manufacture of translucent sheeting, and those "Stypol"

resins employed for potting and casting electronic equipment, will still be sold exclusively by Robertson Thain, Ltd.

SYNTHETIC RESIN PRODUCTION.—Blackburn and Oliver, Ltd., of Lamberhead Industrial Estate, Pemberton, Wigan, have ceased manufacturing paper tubes and bobbins and are now concentrating on the production of Synphorm synthetic resins and allied products. They are also planning the formation of a new company to manufacture phenolic moulding powders.

CHEMICALS FOR THE PAINT TRADE.—A new booklet, "Technical Chemicals for the Paint Trade," has been published by Howards of Ilford, Ltd. Although written primarily for the paint trade, it will be of interest to all connected with the surface coating industry. Copies may be obtained from the company at Ilford, Essex.

MR. GEOFFREY ROWE, who has been with the Projectile and Engineering Co., Ltd., for the past eight years, engaged on the design and development of injection moulding and extrusion equipment, is joining Peco Machinery Sales (Westminster), Ltd. In his capacity as technical service engineer, he will be able to bring to the new company considerable experience in moulding and extrusion.

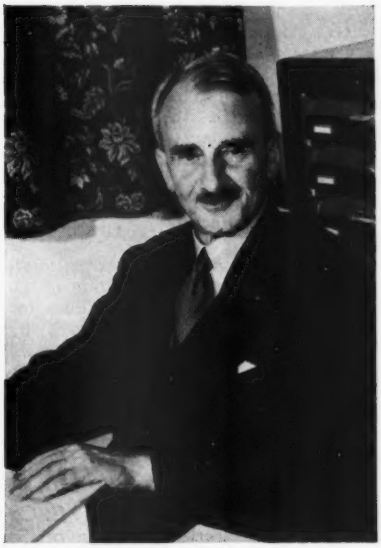
NEW APPOINTMENT.—The Solartron Electronic Group, Ltd., have formed an Industrial Controls Division under Mr. Walter Titmus. The Division is initially concerned with the new Check-Weigher, Non-destructive Testing Equipment and the application of many well-known Solartron instruments to normal industrial production as distinct from laboratory, test house and development applications.

MR. A. E. UNDERWOOD.—The Plessey Co., Ltd., announce that Mr. A. E. Underwood has been appointed to the main board. Mr. Underwood joined Plessey from Salford Instruments, Ltd. (a subsidiary of the G.E.C.), in 1948. He was appointed an executive director in 1951 and a director of Plessey International, Ltd., in January, 1954.

PETROCHEMICALS, LTD.—BOARD OF DIRECTORS.—The board of directors of Petrochemicals, Ltd., now a subsidiary of Shell Chemical Co., Ltd., has been reconstituted as follows: W. F. Mitchell, chairman; L. H. Williams, managing director; F. H. Braybrook, general manager; F. Mackley; E. J. Barnsley; L. R. Batten.

MR. BERTRAM WATSON, who founded Expandite, Ltd., twenty-one years ago and who has served as managing director since the company's inception, has been appointed chairman of the board of directors. The company is one of the very few in the world, and the largest of its kind outside the United States, specializing in jointing materials and sealing compounds for roads, aircraft runways, hydraulic structures, building and engineering industries.

I.C.I. PLASTICS DIVISION DIRECTOR.—Dr. R. G. Heyes has been appointed a director of the Plastics Division in succession to Mr. F. T. Woolner who retired at the end of August. Prior to this appointment Dr. Heyes was general works manager, a position he has held since 1953.



Mr. F. T. Woolner who retires from the board of I.C.I. Plastics Division.

Mr. F. T. Woolner joined the plastics division of I.C.I. in 1939 and became production director in 1940.

OVERSEAS TOUR.—Mr. L. Peters, a director of S.P. Structural Plastics, Ltd., manufacturers of reinforced laminates and mouldings, left England for an extensive overseas tour to investigate new markets for their products. Dr. Peters will be visiting France, Italy, Greece, Egypt, India, Pakistan, Indonesia, Canada and Australia.

CHANGE OF TITLE.—Campden Plastic Products, Ltd., has been reorganized and is now trading under the name of Campden Plastic Products (1955), Ltd. The address and telephone number remain the same.

LIMITED COMPANY.—The business formerly trading as Peter Stanley is now converted into a limited company, Stanley Plastics, Ltd., of Hambrook, Chichester.

NEW COMPANY FORMED.—The British Oxygen Co., Ltd., announce today that their Chemicals Division is being brought under a new subsidiary company, which will be known as British Oxygen Chemicals, Ltd. The objects of the new company are to manufacture and sell chemical derivatives of carbide of calcium, acetylene, nitrogen, oxygen, etc. The authorized capital is £1,500,000, which will be divided into 1,500 shares of £1 each. The directors are Dr. F. C. S. L. Lewin-Harris and Dr. R. F. Goldstein.

CHANGES OF ADDRESS.—The London offices of The Geigy Co., Ltd., are now at 42 Berkeley Square, London, W.1, telephone number Hyde Park 9416.

The Plimpton Engineering Co., Ltd., have moved to Tabley Street, Park Lane, Liverpool 1.

Wilkinson and Gross, toy manufacturers, have moved to 75 Filmer Road, London, S.W.6.

Dr. R. G. Heyes who succeeds Mr. F. T. Woolner on the board.

LUMENATED CEILINGS, LTD.—After a distinguished banking and shipping career in the Middle East, Mr. Richard McCullough has been appointed managing director of Lumenated Ceilings, Ltd. The company, a subsidiary of Thermotank, Ltd., manufacture the luminous ceiling architectural lighting system which bears their name.

CHANGE OF TELEPHONE NUMBER.—The Miltoid Sales Department of B.X. Plastics, Ltd., has a new telephone number, Euston 4146-7.

MANAGEMENT LECTURE SERIES.—A series of five lecture discussions with the title "Leadership in the Twentieth Century" will be held on successive Thursdays from 6.30 p.m. to 8 p.m. commencing on November 17. The lectures are to be held at the Fyvie Hall of the Polytechnic, Regent Street, London, W.1, under the auspices of the Polytechnic Management Association. The guest speaker will be Lt.-Col. L. Urwick, who is well known as an author of a number of books and pamphlets on management and industrial organization.

Dr. R. F. Goldstein, director of British Oxygen Chemicals, Ltd.

FRENCH PLASTICS STATISTICS.—In 1938, French production of plastic materials was 8,000 tons. In 1948 it had reached 20,000 tons; in 1952, 25,000 tons; in 1953, 45,000 tons; and in 1954, 70,000 tons. France is now exporting to the French Union overseas, Germany, Northern Europe, Belgium, Luxembourg, Italy and Spain.

INSTRUMENT INFORMATION.—Latest bulletins from Cambridge Instrument Co., Ltd., gives details of instruments for the recording and control of humidity in individual applications.

B.S.I. SALES OFFICE IN BIRMINGHAM.—Through the co-operation of the Birmingham Chamber of Commerce, the British Standards Institution has now opened a sales office in the headquarters of the Chamber at 95 New Street, Birmingham, 2.

This development is in line with B.S.I.'s policy of making British Standards readily available at important industrial centres. Experiences in Manchester, where the B.S.I. has for long had a branch office (now at Coronation House, Market Street), has shown that such a facility meets a very real local need.

The New Street office will operate at all normal working hours. In addition to the sales counter, it will provide facilities for the inspection of British Standards by interested persons.

Normal reference facilities will continue to be available at the public library in Birmingham, as in many libraries in other parts of the country.

GOLFING SOCIETY RESULTS.—The results of the P.I.G.S. meeting at the Berkshire Golf Club on Tuesday, September 13, were: "Artid" Trophy (Handicap), winner, A. H. Leicester (18), 90−18=72 net: runner-up, F. T. Fletcher (10), 84−10=74 net. "I.C.I." Trophy (Scratch), winner, C. Parkinson, 83 gross. "Rootes" Prize (Stableford Bogey Foursomes), winners, C. H. Guyatt (12), R. F. Johnson (7), 37 points. Runners-up, J. T. Hyde (14), C. W. Thomas (11), 35 points.

Raw Materials in the Plastics Industry 1945-1965

Extracts from the paper presented by Mr. T. C. Corbett before the London Section of the Plastics Institute on September 29

IN his opening remarks Mr. Corbett mentioned the confused picture of production tonnage figures which has emerged from various published data and, to clarify the position for his own figures, he said "It is important to note that all figures which will be quoted are for primary plastic materials. For example, in the case of p.v.c., it is for unplasticized p.v.c. resins."

After reviewing the last ten years' production and giving the figures which we have for convenience tabulated, the author went on to deal with the problems which arise when increased production of raw materials is demanded. Taking as examples p.v.c. and polymethyl methacrylate he says. "When it is realized that no carbide was manufactured in this country prior to 1939 and that the total carbide requirements for p.v.c. alone are now of the order of 90,000 tons per annum, some idea can be obtained of the immense effort which has been put in to meet demands for p.v.c. Polymethyl methacrylate, on the other hand, provides an excellent example of the long and complicated series of organic chemical reactions which must be carried out before the final commercial product is obtained. In this case one can say briefly it is necessary to erect all the vast mechanism of an oil cracker to obtain, amongst others things, propylene from which to make iso-propanol for acetone manufacture.

Present-day Position

"There is still a shortage of certain raw materials and hence the plastics derived from them. In the thermosetting field the situation is fairly easy with the exception of cresol supplies. In the thermo-plastic field it is not so satisfactory because production of polythene and polymethyl methacrylate can barely meet the demand, it has been necessary to import something like 6,000 to 8,000 tons of vinyl resins per year and an appreciable tonnage of styrene monomer is still being imported from the U.S.A. and Germany. Nevertheless, if we take the present world picture the U.K. position is reasonably good. Taking the estimated world (excluding Russia) production of plastics at just over 2,000,000 tons, about half is produced in Western Europe. Of the latter, Germany and the U.K. account for about 70% with Germany producing slightly more than we do."

	1945	1954-5
Polythene	1,000	20,000
P.V.C.	4,000	50,000
Polystyrene	Nil	30,000
Polymethyl methacrylate ..	?	11,000
Celluloid	1,980	1,300
Casein	2,050	2,100
Cellulose acetate	2,160	4,000
Total	11,190	118,400

Breakdown of Thermoplastic Materials

Of the newer plastics; Mr. Corbett mentioned the polyurethanes. "The polyurethanes are a group of polymers, of which more will be heard in the future. They are capable of being made from a variety of chemicals linked together in an almost infinite number of ways, the one common chemical being polyisocyanate, and they open up a prospect of immense activity in specialized products. They are made from ethylene glycol, adipic acid and tolylene diisocyanate. Other polyalcohols and dibasic acids could be used instead of ethylene glycol and adipic acid, but tolylene diisocyanate made from toluene, nitric acid, hydrogen and phosgene is the most commonly used isocyanate. These form an extremely interesting class of polymers.

Years 1955 to 1965

"The general expansion of the last ten years can be expected to continue during the next five years at any rate. Beyond that it is difficult to estimate with sufficient accuracy but we have fitted 'trend curves' to the data already given. It is shown that the U.K. output of plastics rose from 79,000 tons in 1946 to 200,000 tons in 1954, and since this rate of growth corresponds with an annual increase of 12% compound interest there seems no reason why the expansion should not continue at the same rate for some time. The results of individual years, of course, may show quite a variation. On this basis, therefore, the output of plastics in the U.K. should be about 400,000 tons by 1960 and over 700,000 tons by 1965.

"Present production capacity for thermosetting moulding powders and resins is considered adequate to meet this expansion and no plans for further extensions to plants have been announced. On the phenol side, new plants for monochlorobenzene and phenol are being, or have just been completed to meet increased demands for this raw material. The higher grades of cresol, however, are at present obtained entirely from coal tar distillation since it is uneconomical to make them synthetically, and the present demand is greater than the supply so the position will get worse in the future. In plain words, it is unlikely that any additional demand for cresol-based plastics can be met."

Mr. Corbett ended by saying, "It must always be remembered that a new chemical route to an established process or even some minor change in the present process can lead to a reduction in price, or new properties which might well change the picture in some sections of the plastics industry."

Year	1945	1946	1949	1954	1955	1960	1965
Thermoplastic materials ..	15,000	—	33,000	124,000	140,000	310,000	600,000
Thermosetting materials ..	35,000	—	—	76,000	80,000	90,000	100,000
Totals	50,000	79,000	—	200,000	220,000	400,000	700,000

Yearly Production and Estimated Future Production in Tons

(Above, left) 10-ft. dinghy, by Fibromold Ltd., Chertsey, Surrey. Crystic 189 resin is used to bond the chopped strand glass mat. Buoyancy tanks are moulded into the hull.

(Above, right) The Prime Minister of Nigeria visits Peco.

(Above) Dutch Minister of Defence seen here at the plastics laboratory of the English Electric Company's Guided Weapons Division.

COPENHAGEN TRADE FAIR.—Among the exhibitors at Copenhagen were Bakelite, Ltd., who had as the centrepiece of their stand the glass fibre reinforced polyester sports car body which was manufactured by Martin Plastics, Ltd., from Bakelite polyester resin. Other exhibits included laminates, mouldings in phenolic, urea and alkyd materials and applications of Vybak p.v.c.

British Geon, Ltd., and British Resin Products, Ltd., had a combined stand exhibiting a comprehensive range of their synthetic resins and p.v.c. materials.

E. K. Cole, Ltd., devoted the greatest space on their stand to electrical and electronic products, but industrial mouldings and some of their Gold Seal ware was shown.

MR. PATRICK MOXEY, formerly assistant editor of *British Plastics*, has joined Bakelite, Ltd., as Press officer. His new duties will include the editing of the company's illustrated quarterly, *Bakelite Progress*.

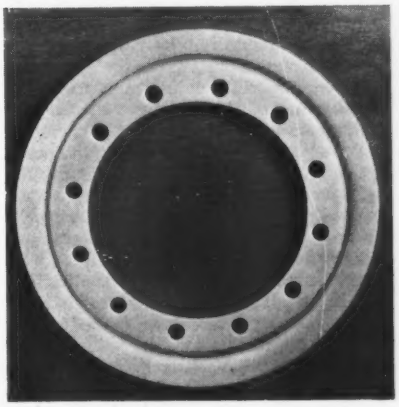
A.E.R. (1938) LTD. wish to announce that a handbook recently issued by the Dohm Group of Companies inadvertently omitted to acknowledge that the R.A.C. badge depicted was moulded and colour sprayed by H. B. Sales, Ltd., Birmingham.

B.I.P. CHEMICALS, LTD., announce that certain grades of their Beetle polyester resins have been considerably reduced in price from October 1, 1955.

S.B.A.C. SHOW, 1955.—The photographs (right and below) were taken at the Flying Display in September (see report this issue pages 345 to 347).

PRIME MINISTER OF NORTHERN NIGERIA.—The photograph shows the Sardauna of Sokoto during his visit to the works of the Projectile and Engineering Co., Ltd. He is seen talking to Mr. E. Gaspar, the company's chief designer, his main interest being in the installation of a complete plant for the manufacture of polythene piping for irrigation purposes.

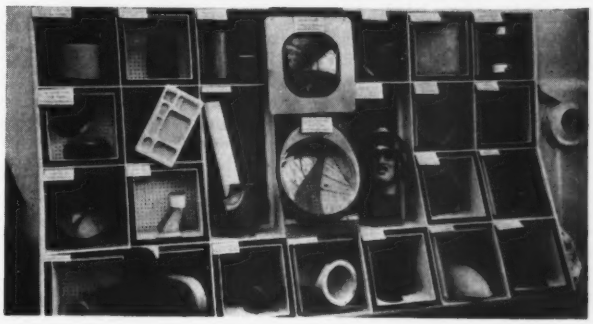
PHOTOGRAPHIC EXHIBITION.—A display of photographs taken by Temple Press staff photographers and representatives of the varied fields covered by Temple Press journals, including *Plastics*, will be on view at the Ilford Gallery, 106-7 High Holborn, London, W.C.1, from October 18 until mid-November. Admission is free and readers of *Plastics* are cordially invited to visit the exhibition which will be open on weekdays from 9 a.m. to 5.30 p.m. and on Saturdays until 12 noon.

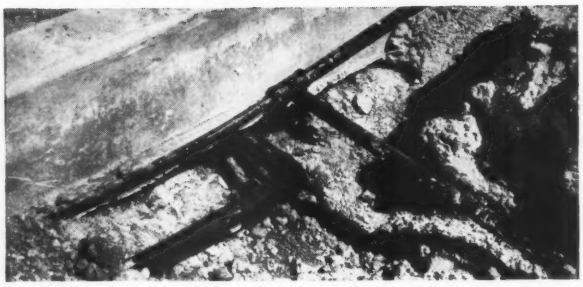


12-in. diameter gasket in "Fluon," made by Richard Klinger Ltd., and shown on the stand of I.C.I. Ltd., at Farnborough.

(Left) Spray unit of Kidde carbon dioxide fire-extinguisher, in black phenolic material, shown and moulded by British Artid Plastics Ltd.

(Right) Display of Thermo-Plastics Ltd., at Farnborough.





Photograph showing the different sizes of pipe used in a large-scale sprinkler system installed in America.

PLASTICS PIPE FOR SPRINKLER SYSTEM.—What is believed to be one of the largest plastic sprinkler systems in the West is being installed in the grounds of the new Porterville State Hospital in the U.S.A. The installation precedes landscaping of a major portion of the hospital area and will cover a total of about 50 acres. Some 90,000 ft. of plastic pipe is being used on the project.

Pipe selected for the job is extruded in Tenite butyrate plastic, which is inherently resistant to the extremely corrosive effect of the soil at the hospital site. Pipe sizes used range from 3 in. for sprinkler lines to ¾ in. for the smallest feeder lines. The pipe is extruded by Plastipipe, Inc. Tenite butyrate plastic, from which the pipe is made, is marketed by Eastman Chemical Products, Inc.

UNPUBLISHED REPORTS.—Castor-oil-tolylene Di-isocyanate Polyurethane as Impregnating, Encapsulating and Potting Compounds: No. PB 108916. Early work has shown that this type of resin was eminently suitable for the purpose, excepting that it was difficult to obtain bubble-free cured resins. This report deals with an investigation of this problem. It discusses the preparation and evaluation of castor oil TDI and describes a technique for obtaining a bubble-free castor oil—TDI polyurethane potting compound. The method involves a preliminary partial reaction of castor oil and di-isocyanate. The resulting clear resin compound has been used very successfully for low-frequency applications. The electrical, mechanical and chemical properties of the resin were evaluated and results are given.

The Effect of Various Pigments on the Electrical Properties of Synthetic-resin Insulation: No. PB 109284. Pigments are usually incorporated in the insulation of synthetic-resin type multi-conductor cables for the purpose of identification. Tests on eight colours, used in two types of vinyl-chloride - acetate copolymers, show no deleterious effects and, in fact, for two colours, white and blue, an improvement in insulation resistance and power factor at higher temperatures was noted. The coloured test specimens were prepared by the Carbide and Chemicals Corporation and no data or colour composition is given, but test results are presented graphically.

Copies can be obtained from Department of Scientific and Industrial Research, Technical Information and Documents Unit, 15 Regent Street, London, S.W.1.

MR. T. P. BERINGTON.—At a meeting of the board of directors of Monsanto Chemicals, Ltd., held on September 27, Mr. T. P. Berington was elected vice-chairman of the company.

Born in Little Malvern, Worcestershire, in 1905, Mr. Berington joined Monsanto in May, 1929, and was appointed to the board of directors in March, 1930.

EIGHTH TECHNICAL EXHIBITION, 1956.—The London Section Exhibition Committee of the Oil and Colour Chemists' Association has now allocated the stands for the 1956 Eighth Technical Exhibition, which will take place on March 20, 21 and 22, 1956, at the Royal Horticultural Society's New Hall, Greycoat and Elverton Streets, London, S.W.1.

"Plastics in the Service of Man"

The following is a list of full names and addresses of companies mentioned in the illustrated feature, "Plastics in the Service of Man," which appears on pages 340 to 342 in this issue:—

60. Plastics in the Bathroom

Associated Builders Merchants, Ltd., Peters Hill, Upper Thames Street, London, E.C.4.
Bakelite—Bakelite, Ltd., 12-18 Grosvenor Gardens, London, S.W.1.
Beetle—British Industrial Plastics, Ltd., 1 Argyll Street, London, W.1.
British Celanese, Ltd., 22-23 Hanover Square, London, W.1.
Brookes and Adams, Ltd., Barr Street, Hockley, Birmingham.
Chiltern Paper Products, Ltd., Belswains Lane, Nash Mills, Hemel Hempstead.
E. K. Cole, Ltd., Ekco Works, Southend, Essex.
Durable Plastics, Ltd., Friary Square, Guildford, Surrey.
Formica—Thos. De La Rue and Co., Ltd., 84-86 Regent Street, London, W.1.
Halex, Highams Park, London, E.4.
Hall and Goulding, Ltd., Shripney Road, Bognor, Sussex.
Hornflowa, Ltd., Solway Estate, Maryport, Cumberland.
Lacrinoid Products, Ltd., Stafford Avenue, Gidea Park, Essex.
Mendle Brothers, Ltd., Station Terrace, Pontgwaith, Rhondda, Glamorgan.
Metal Goods (Plasticized), Ltd., 138 Southbridge Road, Croydon, Surrey.
Perspex—Imperial Chemical Industries, Ltd., Plastics Division, Welwyn Garden City, Herts.
Phipps Plastic Products, Ltd., 244 Bromford Lane, West Bromwich, Staffs.
Plastic Finishes, Ltd., Bridge Road, Camberley, Surrey.
Roanoid, Ltd., 95 Bothwell Street, Glasgow, C.2.
Smith Bros. (Wirewares), Ltd., Spring Road, Hall Green, Birmingham, 11.
Stewart Plastics, Ltd., Purley Way, Croydon, Surrey.
Stone and Simmons, 225-226 Blackfriars Road, London, S.E.1.
Warerite—Warerite, Ltd., Watton Road, Ware, Herts.
Xylonite—B.X. Plastics, Ltd., Higham Station Avenue, Chingford, London, E.4.

MEETINGS

October

14th.—Autumn Dance. Plastics Institute Midlands Section. Botanical Gardens, Birmingham.

19th.—"Some Newer Plastics Materials," E. M. Evans, B.Sc., Ph.D., A.R.C.S., F.R.I.C., D.I.C. Plastics Institute, Western Section, The Technical College, Gloucester. Joint meeting with the local branches of the Chemical Societies. 7.15 p.m.

19th.—"The Modern Gramophone Record." Ladies' evening. Plastics Institute, Yorkshire Section, Hotel Metropole, King Street, Leeds, 1. 7.30 p.m.

19th.—"Some Recent Advances in Physical Organic Chemistry," Professor H. C. Longuet-Higgins, M.A., D.Phil. The Royal Institute of Chemistry, King's College, London, W.C.2. 6-6.30 p.m.

19th.—"Particle Size Assessment," L. O. Freeman, M.Sc., Ph.D., A.R.I.C. Oil and Colour Chemists' Association, Royal Society of Tropical Medicine and Hygiene, Manson House, 26 Portland Place, London, W.1. 7 p.m.

19th.—"Plastics Coated Metals," J. L. Fergus, A.R.I.C. Plastics Institute, North-Eastern Section. 7 p.m.

19th.—"Plastics in Textiles," Plastics Institute, Scottish Section.

20th.—"Injection Moulding," B. E. Terry, A.M.I.Mech.E. Plastics Institute, London Section, Wellcome Research Institution, 183 Euston Road, London, N.W.1. 6.30 p.m.

21st.—"Patents for Inventions," J. W. Crump. Plastics Institute, Midlands Section, The James Watt Institute, Birmingham. 6.30 p.m.

25th.—"Metallic Coating on Plastic Mouldings," L. Holland. Plastics Institute, Midlands Section, Bell Hotel, Leicester. 6.45 p.m.

28th.—Brains Trust on Reinforced Plastics. Plastics Institute, North-Western Section, Engineers' Club, Albert Square, Manchester, 2. 6.45 p.m.

November

3rd.—"Fibreglass," A. de Dani, Dipl. Eng. The Royal Institute of Chemistry, Kingston Technical College, Fassett Road. 6.30-7 p.m.

9th.—"Handling of Alcohols and Other Solvents," F. H. Walmsley. The Institution of Chemical Engineers, The Midlands Institute, Birmingham. 6.30 p.m.

9th.—"Some Aspects of Patent Law," F. E. Lord, B.A., F.C.I.P.A., M.I.T.M.A. Plastics Institute, Yorkshire Section, St. Mark's House, 186 Woodhouse Lane, Leeds. 7.15 p.m.

9th.—"The Physical Testing of Rubbers and Plastics," R. Hayes, A.R.C.S., B.Sc. Plastics Institute, South Wales and Monmouthshire Section, King's Head Hotel, Newport. Joint meeting with The Institution of the Rubber Industry. 7 p.m.

TALKING SHOP . . .

The Expansion of Epoxy Resins. From Whiffen and Sons, Ltd., I have obtained an interesting booklet, reference TD/BA/4(a), dealing with the blowing of epoxy resins. Condensation products of epichlorhydrin with a dihydric aryl compound, these resins are cured by addition of a hardener to give a range of resins having many interesting applications. Of particular importance is the great adhesion to metals, wood, glass and most plastics offered by these resins.

Two blowing agents have been developed to expand epoxy resins, Genitron AZDN, azo-diisobutyricnitrile, which decomposes rapidly at about 100° C., and Genitron OB, p,p'-oxy-bis benzene sulphonyl hydrazide, which decomposes at about 130° C. The booklet defines the method of blowing epoxy resins, gives a recommended formulation and also notes on the density and other properties of the expanded resins. A list of references to periodical and other literature is also included. Copies can be obtained from Whiffens, at North West House, Marylebone Road, London, N.W.1.

★ ★ ★

Dielectric Properties of Acrylic Resins. A recent publication by the Electrical Research Association deals with the dielectric properties of methyl methacrylate resins and has been written by E. Rushton of the National Physical Laboratory. The investigations have been made over a range of temperatures from −50° to +160° C. and a range of frequency from 65 c/s to 24,000 Mc/s. The material has comparatively poor dielectric properties, the loss tangent decreasing steadily with frequency at room temperature, from about 0.06 at power frequencies to 0.01 at cm wavelengths and the permittivity diminishing from about 3.6 to 2.6 at the same length. The material absorbs less than 1% by weight of water, and this water has only a small effect on the dielectric properties.

Copies of this report Ref. No. L/T315 are available, price 9s. 3d. (including postage), from the Association at Thorncroft Manor, Dorking Road, Leatherhead, Surrey.

★ ★ ★

Tools for Vacuum Forming. The continued growth of the vacuum-forming industry has already brought many fabricators face to face with problems arising out of multi-cavity tools. Whilst only single-cavity moulds are called for in the production of large items such as advertising plaques and display cards, the smaller components now being produced enforce the use of multi-cavity tools if the process is to be maintained at economic levels. It is interesting to note the gradual emergence of a special mould-design technique for vacuum forming only.

With the employment of a multi-cavity tool the finishing process assumes serious proportions; emerging from the press as a single sheet, separation has to be carried out to supply the individual mouldings, preferably as cleanly as posible to avoid any further buffing or finishing operations. With small-scale production, band saws or even shears, if the gauge of the sheet is sufficiently thin, can be used perfectly satisfactorily, but on long runs it is obviously desirable that the job should be tooled up as much as possible.

One of the companies specializing in cutting tools is T. Kendall and Sons, Ltd., of French Place, Shoreditch, London, E.1. Established in 1840, the company has manufactured all kinds of cutting and punching equipment for industries as varied as paper, fabrics, leather, rubber and plastics. Machines produced include both power-driven and hand-operated equipment and the company specializes in the manufacture of edge tools for cutting to high-precision limits. Incorporating ejectors, these cutters, which can be made to any outline and profile, are very suitable for starting vacuum moulded articles from the basic sheet and when employed for high-production runs can offer considerable economy in the finishing process.

★ ★ ★

Shell V.P.I. A new method of corrosion-preventive packaging is outlined in the revised and enlarged edition of a pamphlet issued by Shell Chemicals, Ltd. V.P.I., or vapour phase inhibitor, is a method of preventing perhaps the most insidious type of corrosion, that brought about by moisture and air. Shell V.P.I. 260 is a stable organic nitrite, existing in the form of fine, off-white crystals, soluble in water and alcohols. It is apparently harmless, except when present in the air as a fine light powder, in which case it may cause some irritation to the nose and throat if inhaled in appreciable quantities. It protects, by its vapour, any article in an enclosed space. Direct contact of the solid V.P.I. with the solid metal is not required. Although moisture and oxygen are necessary for corrosion to take place. Shell V.P.I. does not react with, or remove either of them, but instead operates successfully in their presence, by actually inhibiting their corrosive action. It may be applied in four different ways, as powder, as solution, as a coating on wrapping material, or in conjunction with a cocoon or other type of plastic envelope. Amongst the companies marketing paper or board coated with Shell V.P.I. are R. A. Brand and Co., Ltd., 38 Long Lane, London, S.E.1.

★ ★ ★

Precision-casting Production. Darwins, Ltd., of Tinsley, Sheffield, 9, have sent me a booklet dealing with the Tru-process, for precision-casting production. I hope shortly to be able to publish some details of this method of casting but in the meanwhile I have seen some excellent moulds used in the productions of dolls. High fidelity appears to be a feature of this process.

★ ★ ★

Perkin Centenary. In 1856, William Henry Perkin, then aged 18, discovered the first synthetic dyestuff, later called "Mauve," and from this discovery have developed the modern dyestuffs industry and the greater part of the world's organic chemical industries. Thus the basic discovery made by this young Englishman 100 years ago, inspired the present-day pharmaceutical industry, synthetic fibres and plastics, pigments and resins in the paint trade, and other industries well recognized today as essential to modern life.

From Mr. Richard Smith I have received first details of the Perkin Centenary Celebration which will be held next year under the patronage of H.R.H. the Duke of Edinburgh. The sponsoring bodies are the Royal Society, The Chemical Society, The Society of Chemical Industry, the Society of Dyers and Colourists, The Royal Institute of Chemistry, and the Association of British Chemical Manufacturers. The general secretary is Mr. J. W. Nicholls, whose address is c/o Society of Dyers and Colourists, 19 Piccadilly, Bradford, Yorkshire. An organizing committee has been set up under the chairmanship if Sir Robert Robinson under whose signature a £100,000 fund appeal will shortly be issued. The purpose of this money will be to set up a trust fund to finance Perkin Centenary Scholarships to promote, advance and encourage technical education in relation to all aspects of the fabrication of application of colouring matters.

★ ★ ★

Plastics in Denmark. Under the heading "New Opening for Plastics," *The Times Weekly Review* for September 22 discussed exports of plastics materials to Denmark from Britain. Business in 1952 was worth nearly £700,000, rising in 1954 to a million and a quarter. These figures will have encouraged those members of the British plastics industry who were exhibiting at the Copenhagen Trade Fair last month. About 18 members of the British Plastics Federation had a direct exhibition and we shall look forward to further news of their success.

★ ★ ★

World's Largest Plastics Press. The Hydraulic Press Manufacturing Co. has designed and built for Zenith Aircraft, Gardena, California, a giant press for moulding reinforced plastics. The daylight is 27 ft., press capacity 600 tons, total height of press 63 ft. 7 in. Details are given on page 13 of *Western Plastics*, August issue.

★ ★ ★

Boats. Many readers of *Plastics* have a dual interest in boats and boating; the August issue of *Western Plastics* published in California carried on page 12 a photograph and brief description of a 20-ft. express cruiser being made by a new company, Skagit Plastics of LaConner, Washington. Glass-reinforced polyester materials are used in the moulding of the hull and numerous other units including decking and buoyancy tanks. A sailing model of 30-ft. length is now under development. In America the interest in small craft has been described as "the Boat Craze." The fact remains that mass production using glass-reinforced materials has brought small craft within the reach of the man in the street. Great Britain, traditionally a country of boatmen, may also find itself riding the crest of a similar boat craze if progress here follows the American pattern.

PLASTIKON.

The Properties and Testing of Plastics Materials—Part 2 (Cont.)

Section 7. Abrasion

By A. E. LEVER,* A.I.R.I., and J. RHYS,† M.Sc.

Abrasion, with special reference to machines for testing polymers for resistance to this, is discussed in this section of the series

ABRASION resistance is defined as the ability of a material to withstand mechanical action such as rubbing, scraping or erosion, which tends to progressively remove material from its surface (1).

The measurement of abrasion resistance is very complex, and is affected by many factors: (a) The physical properties of the material, e.g., hardness, resilience. (b) The type and degree of added filler, e.g., fibre, pigment, etc. (c) The conditions of testing, e.g., nature of abradant, heat developed during the test, etc. (d) Friction.

An excellent discussion and survey of different instruments has been published (2) and this should be consulted by those interested. The work is primarily concerned with the testing of vulcanized rubber, but much of the information is applicable to the testing of plastics.

Following the suggestion of another author (3) the following are the characteristics of abrasion:—(i) Resistance to cutting. (ii) Resistance to tear. (iii) Resilience. (iv) Stress-strain relations. (v) Changes in any of the above by:—Heat, light, ageing, conditions of stretch or distortion, atmospheric cracking, or flex cracking, speed of testing (4).

The author has also published regression equations relating to the Du Pont abrasion resistance with indentation hardness and tensile strength (5).

Types of testing may be classified as follows (2): (a) The use of loose abrasives. (b) Tests for fabrics, coated fabrics and thin films. (c) Tests for solid materials where abrasion is essentially continuous. (d) Where abrasion is discontinuous and the test piece is allowed to recover between abrasion cycles.

Loose Abrasives

1. A stream of carborundum impinges on the surface to be tested (6) (7). Aluminium oxide grit is sometimes used (8), or fine emery is blown against the specimen and the abrasive effect is measured by the amount of light scattered (9). This test is useful for testing the resistance of transparent plastics to high velocity abrasives.

2. The test piece is rotated in a cylinder containing carborundum powder, as in the **Sprout-Evans apparatus** (11).

Both these methods may be used to test the mar resistance of plastics.

The **Olsen Wearometer** meets the requirements of Specification (8) and the **Cizek Abrading Machine** is described.

Fabrics, Films and Coated Fabrics

1. **Martindale** (12) (13). In this method four specimens can be tested simultaneously. Normally the abrasive is stationary and the specimen moves, and the load can be varied, which is an important point, as it has been found that, under a light load, a resilient material will jump, and a certain amount of wear lost. By doubling the load there was about three times the rate of wear (14).

2. **Wyzenbeck** (15). Four test pieces are held stationary under tension, and the abrasive is held on a drum which oscillates by means of a cam.

This is similar to another device (16) used for cable testing, where a circular cage consisting of 15 polished metal rods rotates at 60 r.p.m. The cables are fixed on one side and a pull of 2 kg. is applied on the other, supported by the cage. The number of revolutions of the cage for rubbing away the insulation is the "Abrasive Index."

3. **Schiefer** (17) (18). In this apparatus, both the test piece and the abradant rotate, and it is designed to produce a uniform abrasion over the whole of the surface.

This is similar in principle to the Taber Abrasion Tester (see page 361).

4. **Du Pont Scrub Test** (19). In this case the test piece is folded and then held by two oscillating clamps moving in opposite directions.

5. **Stoll Quatemaster Universal Wear Tester** (20). This was developed by the National Bureau of Standards, and materials are abraded to an "end point" which can be quantitatively defined. It is capable of measuring flat, edge and flex abrasion such as is found in actual wear. Good correlation was found between combat wear and results obtained on this apparatus. It may be useful for plastics and laminates.

6. **Abradoflex Abrasion Tester** (21). This was developed specifically for testing asbestos and other fabric.

Materials with Continuous Abrasion

1. **Du Pont-Graselli-Williams Machine** (22) (23). The test pieces are stationary and abrasive discs move in a vertical plane over the specimens. Results can be expressed as volume loss or loss per H.P./Hour.

This machine, with necessary details, is described in the British Specification for vulcanized rubber (22) and is, at the moment, the most internationally favoured machine in use for the testing of rubber.

The consistency of results is discussed (24).

The results of tests on this machine are dependent on the quality and cutting power of the abrasive paper. The Minnesota Mining and Manufacturing Co. are willing to manufacture a paper of strictly controlled abrasive characteristics for Du Pont machine discs and they will be marked "Tri-m-ite Grade 180E Special I.S.O. Batch." This will be reserved for laboratories requiring dependable test results to B.S.903 (22).

In the usual form of this machine, the rate of work done on the test piece is dependent on its resistance to abrasive and frictional properties. Dunlops have developed a constant torque mode of testing, basically using the Du Pont machine. The method ensures that all the test pieces are subjected to the same rate of working (25).

2. **National Bureau of Standards** (26). This machine is also known as the **Sigler-Holt machine,** and in it the test piece is stationary, the abrasive revolving on a drum. The number of revolutions required to wear 0.1 in. is determined. The ratio of this to that of a standard compound gives the "Abrasive Index" (Standard Compound = 100).

In studying the wear of elastomers, and correlation between test results and actual service wear, the use of a steel screen instead of abrasive paper, effected good correlation at 41° F. (28).

3. **New Jersey Zinc Company** (27). Normally the test piece is stationary and the abrasive is a moving circular track. The results are expressed a volume loss.

4. **A. P. Conti Abrader** (29). The test piece is bonded to a stationary metal base and the abrasive moves on an eccentrically-mounted roller. The load can be varied, and the results are expressed as volume loss. A useful machine for testing conveyor belts.

5. **D.V.M. Schopper Abrader** (29). The test piece moves across the abrasive which rotates on a drum. The results are expressed as volume loss.

6. **Rotating Disc** (29). The test piece is rotated in an opposite direction to the abrasive which is held on a revolving disc.

7. **Bearing Tester** (41). A machine for testing plastic bearings and which attempts to simulate practical operating conditions.

8. **A Gavan Machine** (8). The test piece is stationary and the abrasive is bonded to a rigid base. Full details are given.

Abrasion Discontinuous

1. **Dunlop (Lambourne)** (22). The test piece and the abrasive are both driven, and the percentage slip can be controlled.

Many different types of laboratory abrasion test are in regular use for assessment of wear resistance, and one underlying principle, proposed as a criterion for comparison of the validity of test design, is the principle of constant rate of energy dissipation at the abrading surface (30). Details

* Consultant. † Senior Lecturer in Plastics, National College of Rubber Technology.

of a modification to the Lambourne constant slip machine, to make it conform with the constant power principle, are described. It is suggested that a correlation may exist between abrasion and high temperature flexibility properties of rubber.

2. **Goodyear (Vogt-Angle type)** (31). Either the test piece or abrasive, or both, can be driven with the test piece at an angle to the abrasive.

3. **Akron** (27). This is similar to the Goodyear machine but uses smaller test pieces.

The influence of angle and thickness of the test piece are discussed (32), and it was shown that abrasion loss increases regularly with speed of test (4).

4. **Akron-Croydon** (22). This is a slightly modified form of the Akron machine. The consistency of results is discussed (33).

5. **Kelley** (27). The test piece and abrasive both move. The results are reported as volume loss compared to that of a standard sample attached to the same wheel.

6. **Armstrong Cork** (27) (42). The test piece and abrasive both move. Full details are given in (34). Non-clogging of the abrasive is claimed.

Tests on various laminates are discussed (35).

7. **U.S. Rubber Co. Abrader** (27). A similar machine to the D.U.M. machine.

8. **B.B. Satra** (36). Two test pieces move backward and forward across abrasive cloth. It is used for testing soles and heels.

9. **Taber Abrader** (37) (13). The specimen is rotated on a turntable and a pair of loaded abrasive wheels on edge traverse "a unique rotary transverse sliding action alternately back and forth across the surface of the specimen." Loss of weight on a revolution scale is the measure of abrasion.

For transparent plastics the percentage of light diffused was taken before and after testing (38). A measure of optical effect is not to be confused with the measurement of volume loss (40).

Procedure and details of testing laminated products using this machine are given (46).

10. **Datwyler-Scheltknecht** (14). The old machine resembled a gramophone, in which the sample is secured to the underside of the pick-up arm. The turntable is the emery paper. The number of revolutions is regulated by a differential drive.

This machine was modified to eliminate some of the variables, and comparisons between test results and practical use on cycle treads, etc., were excellent.

The variation of abrasion resistance with change of load may be quite important, particularly with soft products.

11. **General.** Following the R.A.B.R.M. work on the contribution of protruding end fibres from spun staple yarn to the adhesion of rubber to fabric, an examination of the effect of abrasion on the adhesion and fatigue resistance of rubber to cord was made. The test pieces were prepared according to the method given in (39).

Scrubbing

A test has been evolved (43) for determining the resistance of protective coatings to cleaning and scrubbing. The coating is subjected to automatic rubbing action of weighted brushes. The apparatus is illustrated.

Another apparatus (44) is used for wet scrubbing tests on emulsion paint films.

References

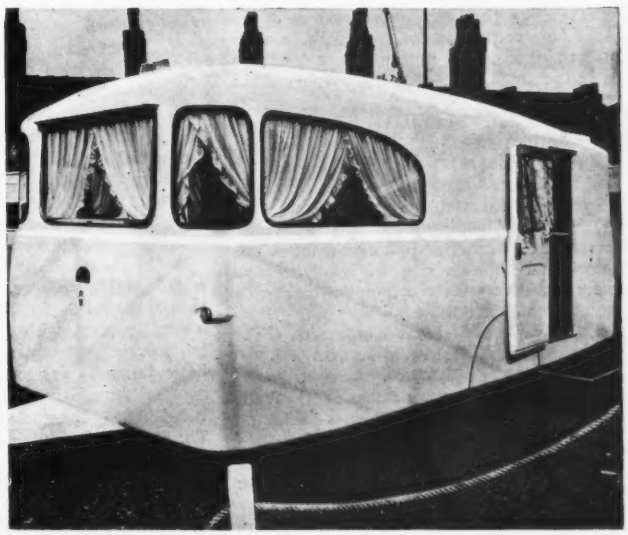
1. A.S.T.M. Spec. D. 1242-52T.
2. *Trans. I.R.I.*, 1950, **26**, 192.
3. *I.R.J.*, 1932, **84**, 231.
4. *J.R.R.*, 1943, **12**, 90.
5. *Trans. I.R.I.*, 1946, **22**, 68.
6. A.S.T.M. Spec. D. 673-44.
7. Strength of Plastics and Glass—Cleaver Hume Press, 1949.
8. A.S.T.M. Spec. D. 1242-52T.
9. *Mod. Plast.*, Mar., 1946, **23**, 165.
11. *A.S.T.M. Proc.*, 1923, **23**, 517.
12. *J. Text. Inst.*, 1942, **33**, T151.
13. Rubber Technology—Butterworth Sci. Pub., 1951.
14. *Rub. Chem. & Tech.*, 1954, **27**, 494.
15. A.S.T.M. Bull., 1948, No. 154, 74.
16. *Kunststoffe*, 1943, **33**, 60.
17. A.S.T.M. Bull., 1949, No. 159, 73.
18. *R.A. (Lond.)*, 1949, **66**, 216.
19. Vanderbilt Handbook, 1948, 433.
20. *Tex. Res. J.*, 1949, **19**, 394.
21. A.S.T.M. Bull., 1952, No. 180, 49.
22. B.S. 903-1950.
23. Rub. Chem. & Tech., 1936, 9, 502.
24. *J.R.R.*, 1947, **16**, 130.
25. Wallace & Co., Ltd., Croydon.
26. Vanderbilt Handbook, 1942, 306 and *I.R.W.*, 1930, **82**, 63.
27. *Trans. I.R.I.*, 1946, **22**, 68.
28. *Ind. Eng.*, 1952, **44**, 825.
29. B.I.O.S. Rept. 1779 Item No. 22, 1948.
30. Third Rubber Int. Conf., 1954, Preprint No. 42.
31. A.S.T.M. Proc., 1931, 31, Part 2, 908.
32. *J.R.R.*, 1947, **16**, 123.
33. *J.R.R.*, 1947, **16**, 129.
34. A.S.T.M. Bull., 1946, No. 143, 23.
35. *T.A.P.P.I.*, 1953, **36**, 28A.
36. *Trans. I.R.I.*, 1946, **21**, 375.
37. *A.S.T.M. Proc.*, 1947, **47**, 1017.
38. A.S.T.M. Spec. D. 1044-49T.
39. *Trans. I.R.I.*, 1949, **24**, 284.
40. A.S.T.M. Spec. D. 1242-52T.
41. *Plastics* (Lond.), 1945, **9**, 185.
42. A.S.T.M. Bull., 1946, No. 143, 23.
43. *Paint Man.*, 1954, **24**, 101.
44. *J.O.C.C.A.*, 1954, **37**, 185.
45. *Rub. Chem. & Tech.*, 1954, **27**, 549.
46. Plastics Eng. Hand.—S.P.G., 1954.

More Plastics Caravans

THE article entitled "Reinforced Polyester Caravan Body" on page 338 of this issue describes the wide use of these materials in the Berkeley caravan. As we go to press we have received details of two other caravans also making use of polyester/glass fibre materials in their construction. Freemans Caravans constructed the "Glencairn."

(Below) The "Glencairn" four-berth caravan.

(Below) The Willerby "Vista" caravan; glass fibre reinforced material is used in its construction.



K

PATENT REVIEW

The following abstracts have been made from specifications at the Patent Office, with the permission of the Controller of H.M. Stationery Office. The country of origin for Convention Applications is shown in parentheses. Complete specifications can be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, price 3s. 0d. each (including postage).

B.P. 733,386. Packet for use in the brewing of coffee and method of making same. To: Kip Inc. (U.S.A.).

Bags of nylon, viscose rayon, rendered chemically inert by removing oil, sizing, etc., taste affecting materials.

B.P. 733,387. Heat-sealed label stocks. F. W. R. Leistikow. Comm. from McLaurin-Jones Co.

The "shelf life" is greatly increased by the use of an adhesive coating in which the adhesive thermoplastic resinous material and the plasticizer, which are solid at normal temperatures, are applied in separate layers which are maintained as distinct layers up to the point of activation by heat.

B.P. 733,392. Projection screens and means of making same. E. G. Beard (Australia).

Of transparent refracting material (cellulose acetate) the surface of which is resolved into sets of parallel grooves of random spacing (2,000 or more per inch). The grooves of at least one set follow concentric circles around a centre outside the screen area itself.

B.P. 733,401. Flame spray apparatus, particularly for spraying with a fusible material. To: Rheem Mfg. Co. (U.S.A.).

Div. out of B.P. 733,334.

B.P. 733,424. Playing pieces for use in the playing of table games. W. L. Keeling.

A plastic flat figure with a hemispherical moulding as base having a recess filled with lead to keep the figure upright.

B.P. 733,440. Tablet and like dispensers. Universal Metal Products, Ltd., M. Biddulph.

In the form of a tubular plastic moulding with a slot extending half-way round the top to allow one tablet to pass out at a time, and a cap fitting over the top and slot attached to the tube by a flexible strap integral with the container.

B.P. 733,451. Web product and method of making the same. To: International Cellucotton Products Co. (U.S.A.).

The fibres are joined together at spaced areas along the web with deposits of an adhesive composition containing mainly polyethylene. The proportion of adhesive is in the range of 25-35% (by weight) of the product.

B.P. 733,517. Device for veterinary use. K. Abildgaard-Elling (Lovens Kemiske Fabrik) (Denmark).

A compressible container with a mouthpiece connected with a flexible cannula for injection of medicaments into the milk channels of teats of domestic animals. Container and cannula may be made in one piece from polyethylene, polyvinyl chloride or other such materials.

B.P. 733,532. Electrical condensers. To: Siemens and Halske A.G. (Germany).

In a casing of polystyrol.

B.P. 733,542. Ear protectors. G. W. I. Hultgren.

Spongy plugs of polyvinyl chloride.

B.P. 733,359. Fire-resistant coating compositions for fibreboard and the like. To: Armstrong Cork Co. (U.S.A.).

Including a dicyandiamide-aldehyde resin.

B.P. 733,568. Phenol-formaldehyde resin-bonded inorganic fibre products. To: Union Carbide and Carbon Corp. (U.S.A.).

For bonding glass and other inorganic fibres.

B.P. 733,584. Composition of matter. To: United States Rubber Co. (U.S.A.).

As adhesives and binders, blends of polyvinyl acetal resins, rubbery butadiene polymers, and phenol-aldehyde resins.

B.P. 733,585. Screw press for mixing and extruding plastics materials. C. Pasquetti (Italy).

A number of interconnected successive chambers arranged in a housing enclose each two parallel intermeshing screws. The pairs rotate at different speeds (one pair 20 r.p.m., one 35, one 50, one 75 r.p.m.). This increases the compression from the inlet hopper to the extrusion die.

B.P. 733,720. Manufacturing thermoplastic pellets. To: Standard Oil Development Co. (U.S.A.).

Mouldable thermoplastic material not wetted by water is extruded into a plurality of rods which are moved in axial direction into a water bath as soon as they are formed. They are maintained separately while continuing to move through the water and the water is kept quiescent so that a meniscus forms around the rods when they emerge. The free ends are then successively severed to form pellets (in particular from copolymers of isobutylene and styrene).

B.P. 733,729. Process for enamelling electric conductors. To: Pirelli S.p.A. (Italy).

An oil-resinous enamel is applied to the outer surface of the polyvinyl acetal enamel coating of the conductor.

B.P. 733,755. Device for supporting strips of photographic roll film during processing. J. M. Makela.

A body of H-shaped cross-section with guide grooves for the film edges.

B.P. 733,779. Spray packaging. B. J. Balfe. To: I.C.I. Ltd.

A composition comprising chlorinated polyvinyl chloride to envelop articles in a moisture-proof film.

B.P. 733,818. Spectacle frames. S. S. Scriven. To: Scrivens (Manufacturing Opticians) Ltd.

A frame with separable ornamental attachments.

B.P. 733,821. Impregnated tubes of fibrous material. M. Fleury (France).

A fibrous sheathing is impregnated inside a fluid-tight chamber, through which the sheathing passes in cold state and under partial vacuum, with a hardenable resin to be polymerized under low pressure. The basic layer so formed may be used as a mandrel for affixing other layers.

B.P. 733,848. Spectacle frame. S. S. Scriven. To: Scrivens (Manufacturing Opticians) Ltd. (div. 733,818).

B.P. 733,911. Apparatus and process for the extrusion treatment of plastic material. L. J. Fuller. To: Welding Engineers Inc.

The material is advanced through a pair of parallel helices rotating in opposite directions, each helix being formed with a forward feed flight and a reverse flight. The reverse rate of feed is less than the forward feed. Thus pressure is created while the material is thoroughly worked through before advancing farther.

B.P. 733,914. Laminated materials and method of making the same. MacEchern and Co., Ltd., W. A. George.

A number of resin-impregnated fabric-base sheets are superimposed with adjacent sheets laid cross-grained. A thin adhesive coating is applied between adjacent sheets. The assembly is bonded under pressure into a single block.

B.P. 733,942. Rotors for extrusion and like machines for treating plastic materials. To: Farrel-Birmingham Co. Inc. (U.S.A.).

To effect an intense mechanical working of a plastic mass within a chamber in a continuous extrusion process, the rotor inside the chamber provides helical channels between its ridges and the ridges have grooves across at an angle so that the material passes from one channel to another.

B.P. 733,948. Couplings for flexible metallic tubing having a flexible cover of plastic or the like. H. J. Hall. To: Interlock Metal Tubing Ltd.

B.P. 733,987. Process for the reduction of polyethylene to pulverulent form. To: Deutsche Gold- und Silber-Scheideanstalt vorm. Roessler (Germany).

Polyethylene pieces are swelled, but not dissolved, in a solvent, then comminuted.

B.P. 734,061. Inhalers. Universal Metal Products Ltd., M. Biddulph.

A nozzle part containing medicated material is slidable in a tubular holder with a captive closure over the nozzle aperture. The holder may be moulded of resilient plastics (polyethylene), the nozzle a moulded plastic tube.

B.P. 734,079. Method and apparatus for the production of resin-bonded materials. V. E. Yarsley.

Mats or fabrics of bonded glass fibres are produced in continuous form by passing the resin-impregnated material through a bath of liquid (e.g., Wood's) metal of such a temperature as to effect the desired degree of cure during the passage.

B.P. 734,115. Plasticized composition. E. Chadwick. To: Distillers Co., Ltd.

Multiple esters are eminently suitable as plasticizers for polyvinyl chloride (and other thermoplastic resins).

B.P. 734,116. Method of joining sheet material. E. Batty, H. R. Touchin. To: Beck, Koller and Co. (England), Ltd.

Dried coatings consisting essentially of a styrenated alkyl resin dissolved in an organic solvent are capable of being "heat-sealed" by brief application of heat and pressure.

B.P. 734,181. Coating compositions. R. B. Morris, K. J. Reed. To: Industrial Colours Ltd.

Fine particles of a spray-dried synthetic resin (cellulose acetate) are dispersed in a film-forming material (solution of a synthetic resin in a volatile solvent). The spray-dried material may be dyed with a fluorescent dyestuff.

B.P. 734,208. Spectacle frames. A. A. Irons.

Detachable side arms in a split frame.

B.P. 734,215. Front projection screens. R. N. Reid.

Made by moulding or rolling from a transparent plastic (3/32 in. thick) with a number of parallel undulations on its rear face covered with a reflecting layer. The front face may be dulled.

B.P. 734,221. Device for slidable supporting and guiding curtains and the like. H. Beer (Switzerland).

A slide of synthetic resin with a pair of cheeks facing each other and limiting oscillations. A sliding or polishing medium (china clay, pumice powder) may be added to the resin during production.

B.P. 734,224. Electric wall bracket made of plastic. A. Sadler. To: British General Mfg. Co. (1941), Ltd.

Two mouldings in the shape of open channels are fitted together to form a tubular arm.

B.P. 734,246. Cases or holders for toothbrushes. R. Grandval (France).

A one-piece moulding of polyethylene with resilient flaps enclosing the brush but not the handle so that it can be placed in a conventional rack.

B.P. 734,321. Separators and electrode assemblies for electric batteries or accumulators. To: Yardney International Corp. (U.S.A.).

Marginal strip portions exposed to the corrosive action of air and gases are provided with a protective resin coating of a waterproof material (methyl methacrylate and others).

B.P. 734,355. Address-printing plate blanks made of a material adapted to be stamped. To: Adrema Maschinenbau G.m.b.H. (Germany).

Part of the area to be stamped is provided with uniformly distributed elevations and depressions on both sides. Such plates can be better stamped and restamped than plain plates. Though mainly for metal plates, the invention may also be useful for plate blanks of thermoplastic material.

B.P. 734,384. Surgical injection devices. Y. H. Kurkjian.

Casing and plunger seat of resilient plastic, the plunger head and rod of rigid plastic.

B.P. 734,393. Box signs. Claude-General Neon Lights Ltd., A. T. Symmonds.

The dish-shaped panel formed from a transparent acrylic-resin sheet is readily removable and replaceable.

B.P. 734,495. Apparatus for filling and sealing containers. J. Lyons and Co., Ltd., R. W. Money.

Refers to containers with a polyvinyl-chloride bag for purees or concentrated soups to be filled with a certain weight of liquid and to be heat-sealed afterwards.

B.P. 734,496. Apparatus for cleansing containers. J. Lyons and Co., Ltd., R. W. Money.

B.P. 734,497. Articles formed of high-melting-point polyamides. L. L. Stott. To: Polymer Corp. (U.S.A.).

Molybdenum disulphide in fine particle form is dispersed in nylon with the result of markedly decreasing the coefficient of thermal expansion, which is an important factor for machine parts.

B.P. 734,537. Cores for electrical inductances. G. W. Bagshaw. To: Plessey Co., Ltd.

Is socket moulded from synthetic resin in the form of a stud.

B.P. 734,567. Device for use particularly as a toy-building element but which may be used as a parcel carrier. G. B. Jacobsen (Denmark).

B.P. 734,643. Embossing roll and means for making the same. W. W. Triggs. Comm. from: Grote Mfg. Co. Inc.

For embossing extremely small lens formations on a thin flexible strip of plastic material for producing reflex reflecting materials. Smooth-surfaced glass beads are supplied to a part of the roll surface, arranged into formations and pressed into the roll, preferably made of soft stainless steel. They form cavities later producing the protuberances on the strip of material.

B.P. 734,664. Vinyl resin-alkyd resin wrinkle coating composition. To: New Wrinkle Inc.

A finely divided polyvinyl-chloride resin is dispersed with an alkyd-type resin solution. The vinyl paste is mixed with colouring material, drier, solvent and further alkyd resin, and can then be sprayed and baked.

B.P. 734,683. Process for the improvement of the hardening characteristics of unmodified phenol-formaldehyde resins. To: Chemische Werke Albert (Germany).

One or more resinous reaction products as claimed in B.P. 718,283 are added.

B.P. 734,694. Process for the improvement of the hardening characteristics of phenol-formaldehyde resins. To: Chemische Fabriken Albert (Germany).

One or more salts of tautomerically reacting compounds with di- or higher valent metals are added.

B.P. 734,716. Toilet appliance. C. McGregor.

Mainly for a brush for massaging or washing with an elongated handle and a guide slidably mounted on the handle.

B.P. 734,735. Windscreens and associated air deflectors for motor road vehicles. Austin Motor Co., Ltd., J. R. Rix.

Across the bonnet top nearer to the bottom of the windscreen than to the front of the bonnet.

B.P. 734,743. Deflectors for automobile windscreens. W. E. O'Shei.

Adjustable into operative position and into horizontal (inoperative) position.

B.P. 734,752. Apparatus for wrapping articles. R. Betts, S. Midgley, D. H. Laycock.

For wrapping and sealing foodstuffs in "Pliofilm."

B.P. 734,825. Artificial-resin jointing strip for jointing of highly stressed building strips. To: Wey-Etablissement (Switzerland).

The strip (of e.g. polyvinyl chloride) for making a joint in a concrete, cement, stone, asphalt construction is formed with a central reinforcing portion, longitudinal ribs and a central flexible tube having its largest cross-section perpendicular to the sides of the strip. The central strengthened portion serves to accommodate the movements of the jointing portions.

B.P. 734,848. Manufacture of polymerization products. To: W. C. Heraeus G.m.b.H., Deutsche Gold- und Silber-Scheideanstalt vorm. Roessler (Germany).

A polymerization accelerator is employed which is made up of components selected from three groups: (1) heavy metals and compounds thereof; (2) secondary and tertiary amines and certain organic compounds; (3) organic sulphon derivatives. When using such an accelerator polymerization, even at room temperature, is complete within 6 to 8 or even less minutes. At 35° C. the time is still shorter.

B.P. 734,852. Clothes peg. P. M. McCarthy.

An inverted U-shaped member with a lever attached to one of the limbs. The co-operating parts are serrated.

B.P. 734,913. Thermoplastic terpolymers. To: Monsanto Chemical Co. (U.S.A.).

Articles moulded from polymers of styrene soften and frequently turn white when subjected to boiling water in normal washing and sterilizing procedures. This is not so when moulding from a terpolymer of styrene, acrylin acid and acrylonitrile mixed in certain proportions. The moulded articles are also resistant to hydrocarbons and cold caustic alkali.

B.P. 734,942. Collars and shirts. T. W. Holt, S. Seymour.

A strip of pliable plastic material secured to each collar for attaching the collar to the neckband.

B.P. 734,968. Cellulose ethers and cellulose-ether compositions. To: Hercules Powder Co. (U.S.A.).

Relates to a process for the colour and viscosity stabilization of an alkyl cellulose and to the resulting compositions.

B.P. 734,987. Cigarette holders. To: Buttner-Pipe G.m.b.H. (Germany).

For enabling the smoker to smoke right down to the end.

B.P. 735,003. Tooth-brush. W. Hennings (Germany).

A collapsible tooth-brush. Part of the handle serves as protective casing when collapsed.

B.P. 735,006. Thermoplastic compositions. To: United States Rubber Co. (U.S.A.).

Vinyl chloride polymers are blended with relatively small amounts of neoprene. The mixtures, which are tough, may be used to fabricate parts of machines, for containers and pipes, where resistance to corrosion is desired, for electrical parts and numerous other articles (for laminates also and for sponge material).

B.P. 735,028. Method and apparatus for handling and melting nylon to be used in moulding articles. E. E. Montross. To: Polymer Corp.

A column of relatively small cross-section of flake or granular nylon is advanced by a feed screw and heated so as to form a stream of melted nylon. This stream is charged through special nozzles into the moulds or intermediate containers.

B.P. 735,029. Method and apparatus for moulding rods of nylon. L. L. Stott. To: Polymer Corp.

The molten stream of nylon is delivered

from a nozzle into a cylindrical preheated mould. After charging, a closure plug is inserted, the charge mould tube placed in a press and the closure plug brought down to develop high moulding pressure.

B.P. 735,046. Hose suspenders. H. E. Stait.

B.P. 735,059. Combined toilet article case and toilet requisite. To: Société Civile Derlit (France).

To contain soap and a nail brush serving as lid to the soap container.

B.P. 735,093. Process for manufacturing tubular cases of plastics and apparatus for carrying out said process. To: Società Nazionale Prodotti Chimici e Farmaceutici S.p.A. (France).

A hollow core is introduced from above into the mould, which is filled with, e.g., polyvinyl chloride powder. The lower opening of the core is closed by an upstanding pin before reaching the powder. The mould is heated to render the material plastic, then cooled and the core with the tube thereon withdrawn upwardly. By blowing air through the hollow core, the tube is stripped from the core.

B.P. 735,127. Adhesive compositions and method of making the same. To: Armstrong Cork Co. (U.S.A.).

Rubbery copolymers of butadiene, acrylonitrile and phenolic resins. The butadiene-acrylonitrile polymer should contain approximately 30% acrylonitrile (acetone insoluble gel content less than 10%).

B.P. 735,149. Synthetic plastic material protective respiratory mask. J. A. J. Zawadski.

A nosepiece with a partly flat bottom with apertures.

B.P. 735,151. Laminating compositions. To: American Cyanamid Co. (U.S.A.).

A dry support sheet impregnated with an unsaturated polyester resin and an alkylidene-bis-acrylamide.

B.P. 735,162. Process for the production of shaped bodies of polyethylene. To: Deutsche Gold- und Silber-Scheideanstalt vorm. Roessler (Germany).

The polyethylene is first swelled by means of an organic solvent or solvent mixture at ordinary or only moderately elevated temperature, then the particles are fused together and the mass formed into bodies at a temperature below the softening point.

B.P. 735,175. Process of and apparatus for the manufacture of paper-like materials from thermoplastic synthetic materials. J. B. Lings. Comm. from: C. F. Roser G.m.b.H.

Sheets or webs are produced by subjecting the fibre mixture first on one side to pressure and heat at individual places while keeping the other side cool, then treating the other side in the same way so that the melting into an impermeable foil is avoided.

B.P. 735,197. Face mask for use in dust-laden or other contaminated conditions. R. J. Richardson.

A nosepiece in a hood leaving the mouth portion free. The air passes through a tube to the nose.

B.P. 735,236. Removable tabs or labels for marking textile articles. H. Meyer. To: Polymark Ltd.

Non-thermoplastic yarns and thermoplastic yarns in one direction are closely interwoven with non-thermoplastic yarns in the other direction, so that the interlacing does not depend entirely on the thermoplastic yarn.

B.P. 735,240. Mounting block for electrical accessories. F. W. Osborn. To: Simplex Electric Co., Ltd.

A shield of incombustible material is attached to the body lying between body and wall structure.

B.P. 735,249. Toy building set. B. Jorgensen.

To be used with H-shaped keying members.

B.P. 735,262. Knitting bag. W. H. C. Bishop. To: Gilchrist and Fisher Ltd.

With a pocket for a knitting pattern to be seen through a transparent window secured to the plastic of the bag by electronic welding.

B.P. 735,310. Reinforced thin flexible sheet-like material. A. E. Carlson.

To improve the tear resistance of, e.g. paper cartons, the corners are reinforced by thin bands or ribbons produced from untwisted synthetic filaments (nylon, cellulose acetate, etc.) coated with an (synthetic resin) adhesive and then brought into contact with the paper.

B.P. 735,376. Time-piece mechanisms. To: Lip S.A. d'Horlogerie (France).

The bearing element proper is made of synthetic resin (polytetrafluorethylene) located in a metallic casing. The casing is slidable in its support for adjustment.

B.P. 735,389. Safety helmet. Charles Owen and Co. (Bow), Ltd., W. Burek.

B.P. 735,405. Composition of matter and use thereof. United States Rubber Co. (U.S.A.).

Resin-bonded glass fibre articles are made by bonding fibrous glass to cured polyester resins containing small amounts of certain organo-oxysilanes. The strength of the products is increased; they have also greater transparency.

B.P. 735,458. Method of and apparatus for feeding thermoplastic material. J. B. Brennan.

An elongated rod is passed under pressure through a guide. Heating means are located near the exit end, cooling means near the entrance to maintain the material solid. For delivering the material in spray form.

Electron Microscopy at The National College of Rubber Technology

Notes on the use of a Phillips' microscope in the study of Natural and Synthetic Polymers

MISS MARGOT STEPHENS, specialist in electron microscopy at the National College of Rubber Technology, has contributed the following notes on the use of the Phillips 100 kV. model. The photographs indicate the scale of magnification possible with this instrument:—

"The miscroscope employed is a Phillips 100 kV. model with a 25 A high resolution lens, giving a continuously variable magnification of from 1-80 thousand diameters.

"The specimen image is viewed direct on to a fluorescent screen, and photographed by means of the camera which is incorporated in the column under vacuum, and uses a 35 mm. film.

"At the moment, investigations are being concentrated on the particle size, distribution and shape of natural and synthetic latices. Fig. 1 shows a typical micrograph of a p.v.c. latex.

"The electron miscroscope has also been found to be of great assistance in the study of various compounding ingredients of rubbers and plastics. In this field, work on the distribution of factice and zinc oxides has been carried out.

"The main difficulties in the use of the electron microscope lie in the techniques of preparing the specimens. Unless the structure of the sample is first considered and care taken in assessing its properties and preparing it for examination, difficulties will be found of certain latices which show a tendency to flatten either under their own weight when dispersed on a supporting film or with the material used to shadow them such as gold or palladium, giving a completely false impression of the size and shape of the particles.

"Agglomerations of zinc oxide particles and carbon blacks also require the use of special techniques in their preparation."

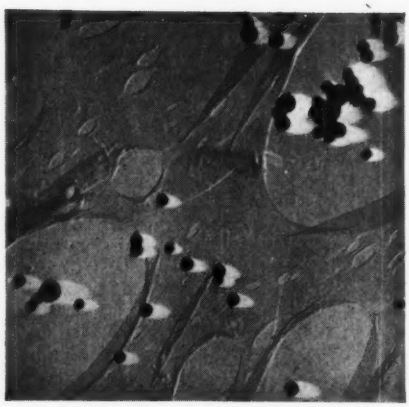
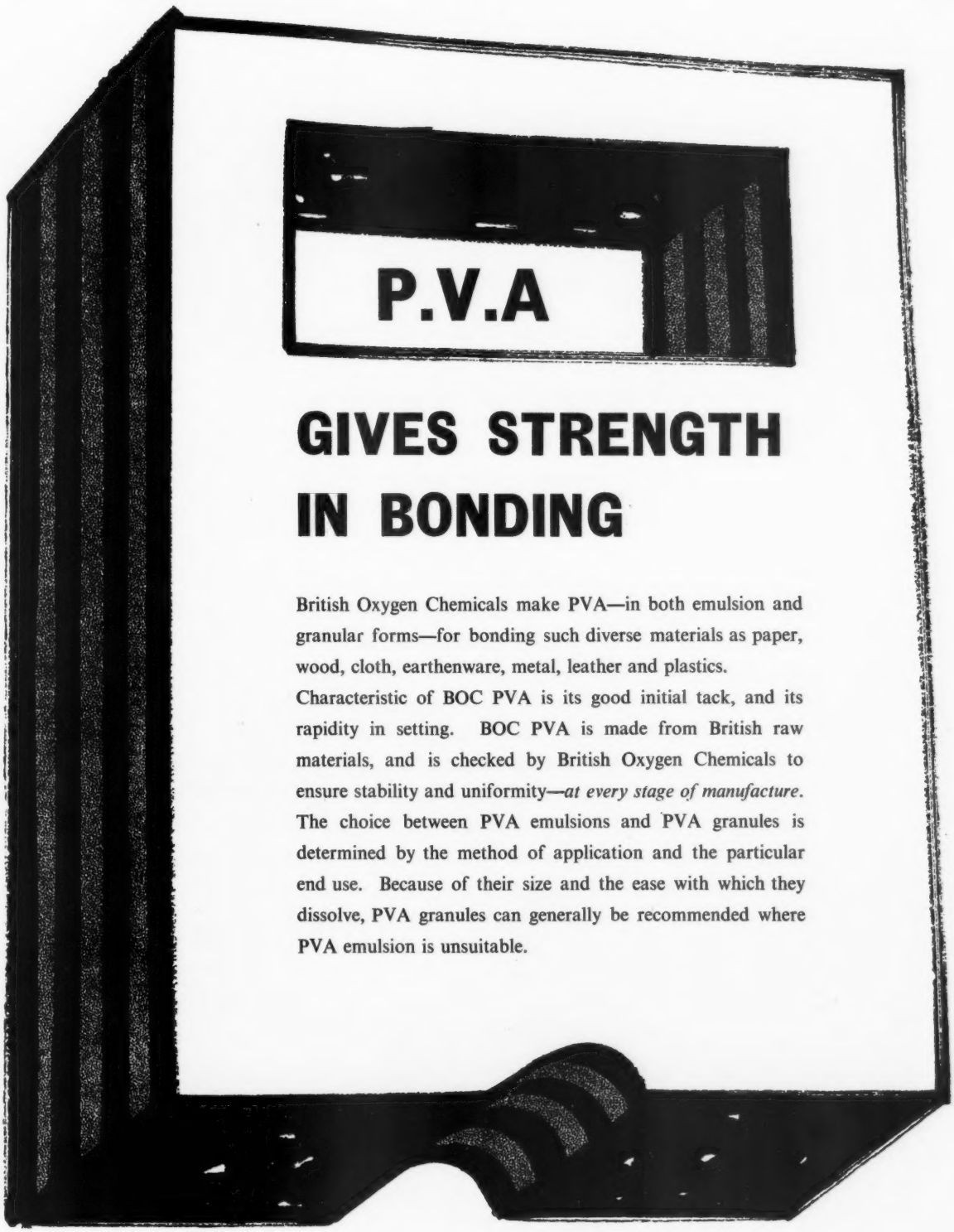


Fig. 1—Micrograph of a p.v.c. latex.
8,000 screen magnification.
60 kV.
½ second.
Distance between markers—10 microns.
Actual magnification on photograph—5870.

Courses of instruction at the National College include tuition in the use of the electron microscope, and in the interpretation of photographs. The machine is also available for assistance in advanced study by graduate students who are engaged in research for higher degrees and other purposes.



GIVES STRENGTH IN BONDING

British Oxygen Chemicals make PVA—in both emulsion and granular forms—for bonding such diverse materials as paper, wood, cloth, earthenware, metal, leather and plastics.

Characteristic of BOC PVA is its good initial tack, and its rapidity in setting. BOC PVA is made from British raw materials, and is checked by British Oxygen Chemicals to ensure stability and uniformity—*at every stage of manufacture.*

The choice between PVA emulsions and PVA granules is determined by the method of application and the particular end use. Because of their size and the ease with which they dissolve, PVA granules can generally be recommended where PVA emulsion is unsuitable.

For further details please write to :—
British Oxygen Chemicals Limited,
Vigo Lane, Chester-Le-Street, Co. Durham. Tel.: Birtley 145.
London Office: Bridgewater House, Cleveland Row, St. James's, S.W.1. Tel.: Whitehall 9777.

UCC

CHEMICALS FROM COAL

PHENOL: 39.5/41°C

CRESOLS: 60/64% meta content
ortho, pure grade A

XYLENOLS: 1.3.5.
2.4/2.5
5/7°
(specified cuts as
required)

Enquiries to:-

UNITED COKE & CHEMICALS COMPANY LTD.

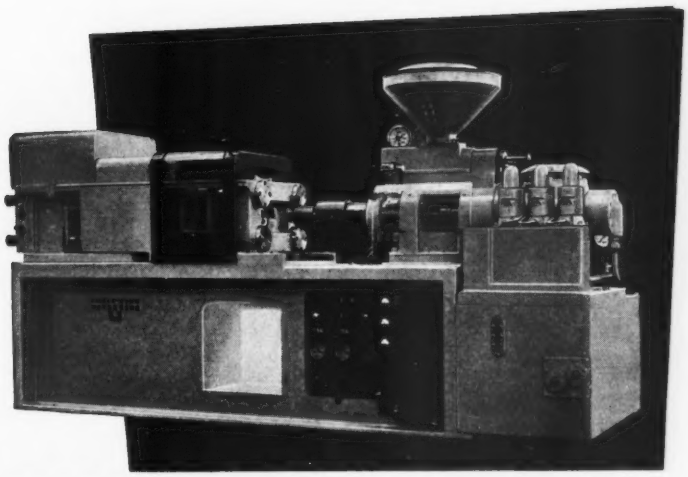
(SALES DEPARTMENT 71) 34, Collegiate Crescent, Sheffield, 10

Telephone: Sheffield 63025 Telegrams: 'Unichem' Sheffield

THE UNITED STEEL COMPANIES LTD

UCC.1.

ANKERWERK NÜRNBERG

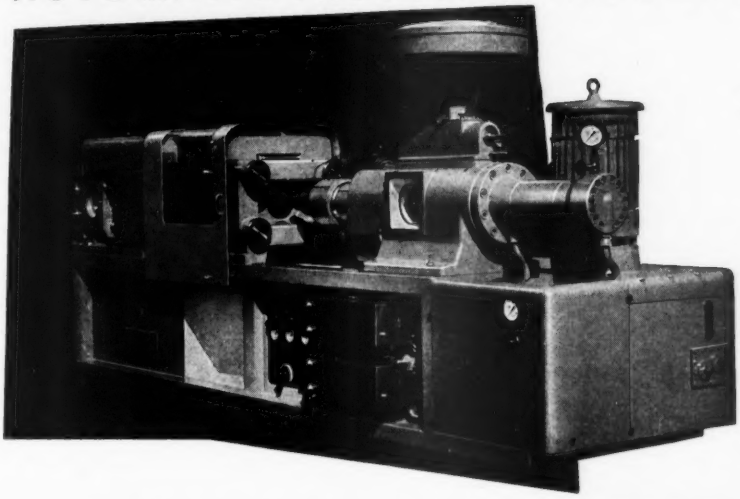


FAST CYCLING MACHINE

SE 50/75

4 oz.

AUTOMATIC INJECTION MOULDING MACHINES



SE 200

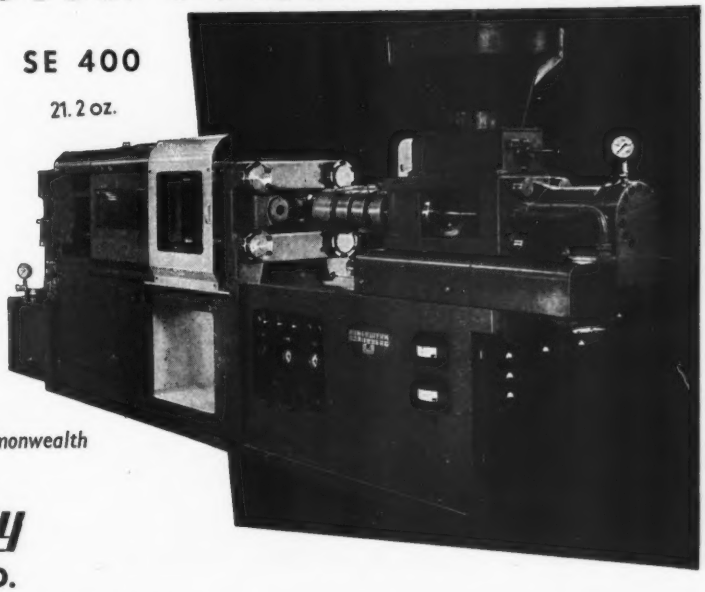
10.6 oz.

ANKERWERK GEBR. GOLLER NUERNBERG

We most cordially invite you to visit our **Stand No. 5-17, Hall E,** at the Dusseldorf Plastics Exhibition, October 8-16, 1955.

SE 400

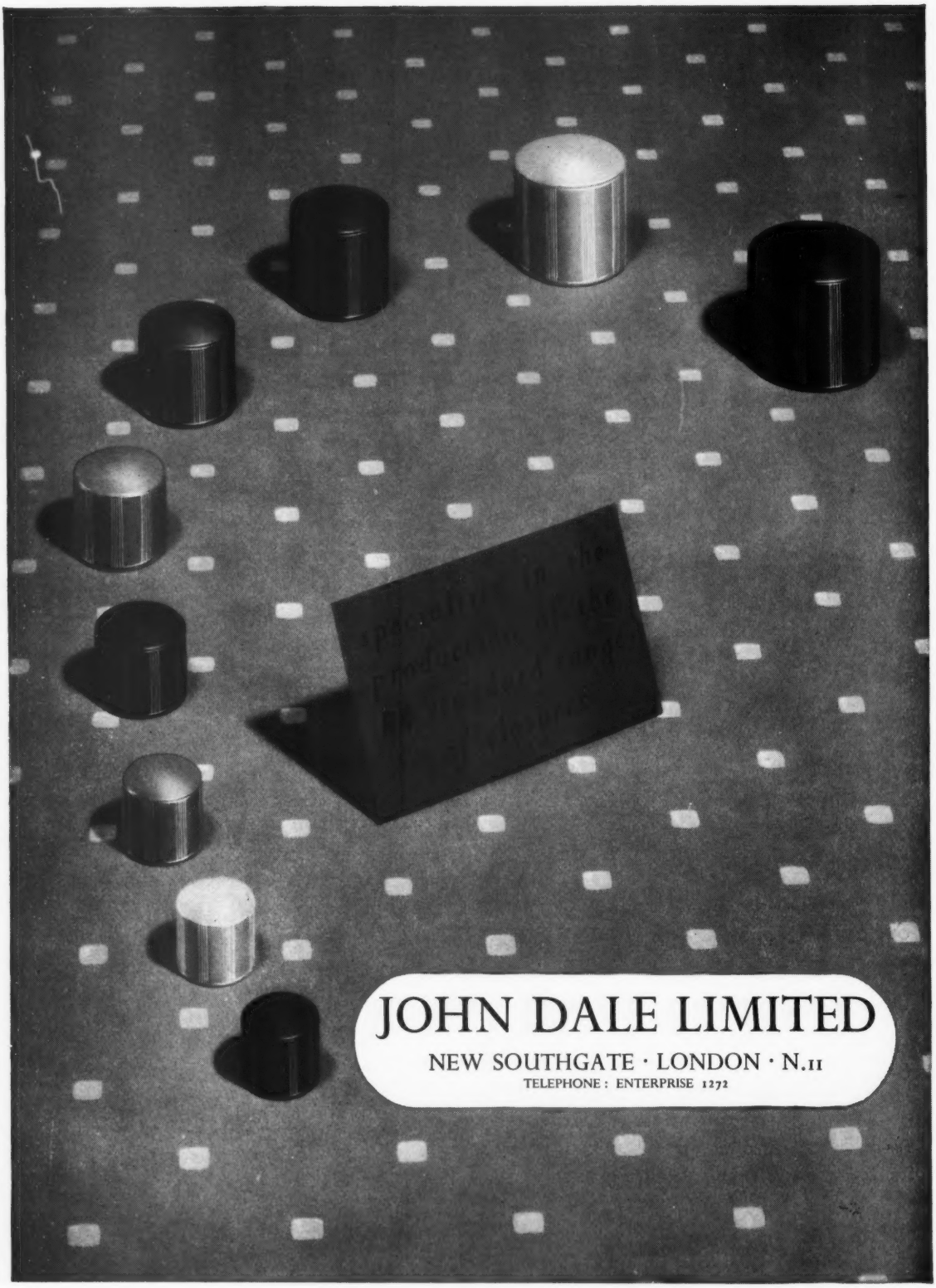
21.2 oz.



For details please write to :
Sole Selling Agents for U.K. and Commonwealth

Aldersley
AGENCIES LTD.

TETTENHALL · WOLVERHAMPTON · TELEPHONE : WOLVERHAMPTON 52071 (3 lines)


JOHN DALE LIMITED
NEW SOUTHGATE · LONDON · N.11
TELEPHONE : ENTERPRISE 1272

Hornflowa

U.F. POWDERS

★

PRESSRITE

The "General Purpose" MOULDING POWDER

Paper-filled, giving excellent physical properties, translucent, fine or densified. Available in 3 grades of flow: fast, medium and stiff. All colours.

★

FLOWRITE

Specially prepared for fine Quality Mouldings

High translucency imparted by special cellulose filler, undensified, any colour matched to order, ideal for buttons, custom jewellery, etc.

★

HORNFLOWA

RESINS

Adhesives (close-contact and gap-filling types) surface coatings, textile impregnation (anti-shrinkage).

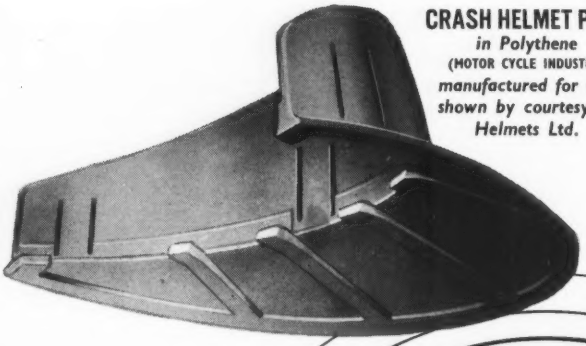
We are also makers of
Jigs and Fixtures
Gauges
Moulds and Dies

Hornflowa LIMITED

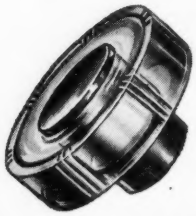
Phone: MARYPORT 251-2
Grams: HORNFLOWA, MARYPORT

MARYPORT · CUMBERLAND

CRASH HELMET PEAK
in Polythene
(MOTOR CYCLE INDUSTRY)
manufactured for and shown by courtesy of Helmets Ltd.



TWO COLOUR RADIO KNOB
in Polystyrene manufactured for and shown by courtesy of Plessey Limited



POLYTHENE

POLYSTYRENE

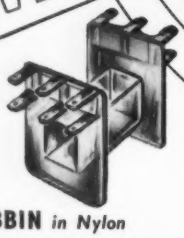
P&B

INJECTION MOULDING

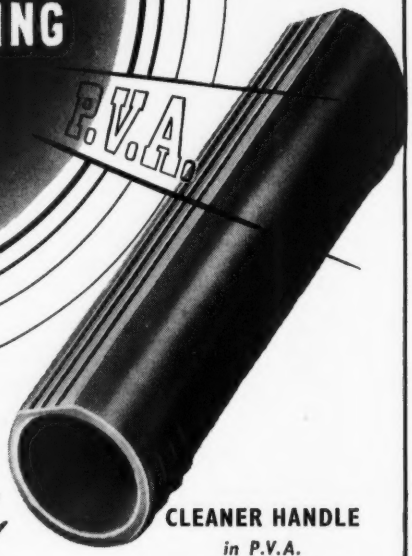
Specialists

NYLON

P.V.A.



BOBBIN *in Nylon with a general wall section of ·020 with 6 inserts of ·060 by ·015 moulded in* (AIRCRAFT INSTRUMENTS) *manufactured for and shown by courtesy of Sperry Gyroscope Co. Ltd.*



CLEANER HANDLE
in P.V.A.
manufactured for and shown by courtesy of Siroma Ltd.

If you require mouldings of the highest quality and dimensional accuracy at competitive prices — get in touch with

Punfield & Barstow

(MOULDINGS) LTD.

BASIL WORKS, WESTMORELAND RD., QUEENSBURY, LONDON, N.W.9

Telephone: **COLINDALE 2266/7/8** *Telegrams:* **PUNFIBARS, HYDE, LONDON**

RILIDE P.V.C. LEATHERCLOTH

Here is a first class material for Jerkins at a very competitive price. The very *feel* will tell the knowledgeable fabricator he's "on to" something good.

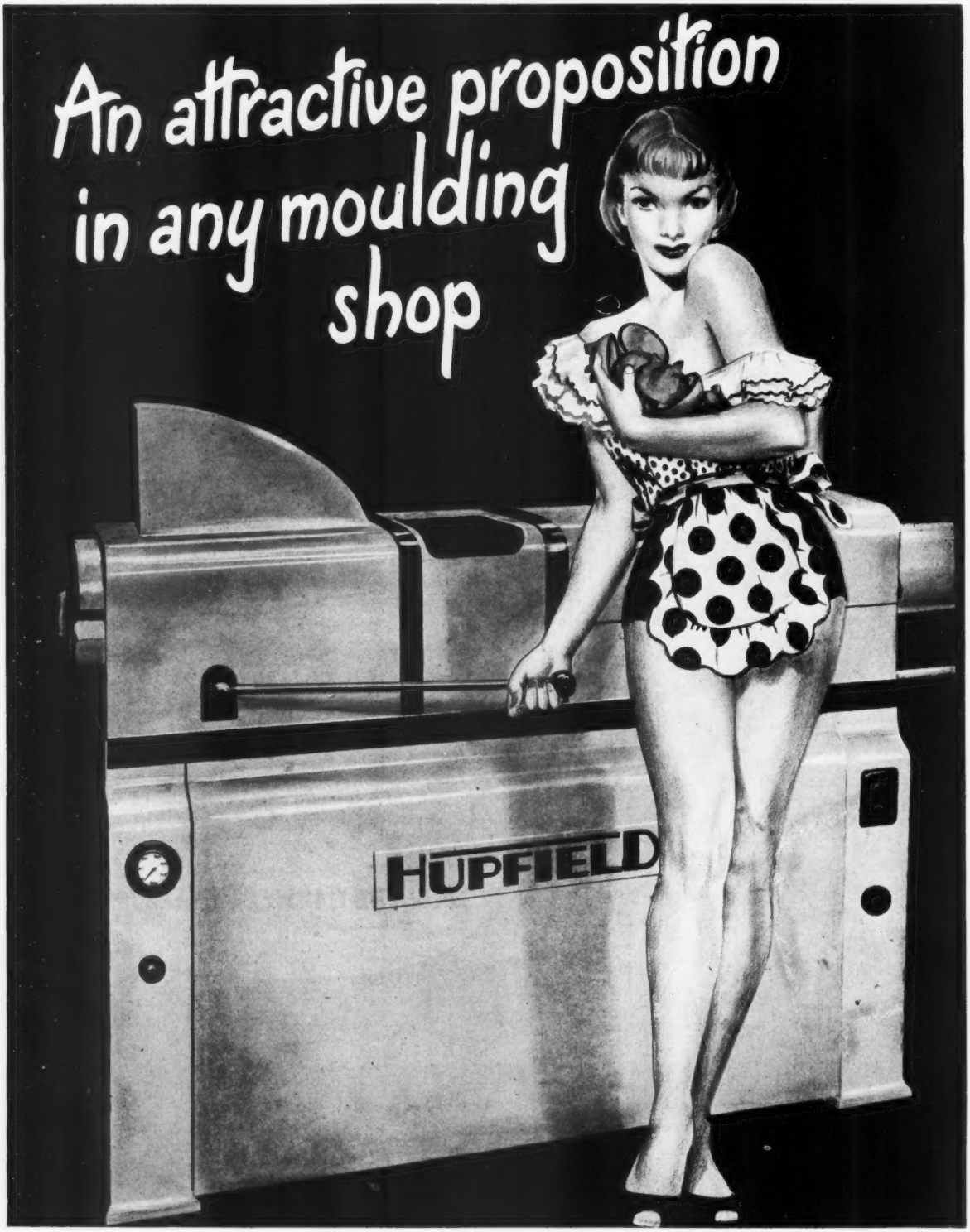
- ★ High quality P.V.C. bonded to a warm fleecy lining.
- ★ Waterproof, windproof and highly resistant to oils and greases.
- ★ Outstanding resistance to continued flexing.
- ★ Does not crack or become excessively stiff in low temperatures.
- ★ Excellent working properties — flexible and simple to handle ; very easily stitched.
- ★ An exceptional variety of grains and colours.

In continuous rolls of 50-52" width and 30-35 yd. length.

Available also in varying gauges and fabric backings for other trades, i.e. Car Upholstery, Furnishing, Travel Goods, Shopping Bags and Handbags.

Write today for samples and prices.

RUBBER IMPROVEMENT LIMITED, WELLINGBOROUGH, NORTHANTS · WELLINGBOROUGH 2218



1 and 2 oz. Injection Moulding Machines

Write for particulars **Plant Installations Ltd.** *Sole Agents*

Welton Manor, Welton, Nr. Daventry, Northants. *Tel.: Daventry 257*

FOR TECHNICAL ADVICE AND DEMONSTRATION PHONE THE MANUFACTURER'S LONDON WORKS AT WORDSWORTH 4488

WHAT KIND OF STRENGTH DO YOU NEED?

WHAT KIND OF STRENGTH DO YOU NEED IN YOUR PRODUCT? Enduring strength as demanded in the construction of lightweight aircraft? Mechanical toughness as required in press tools? Strength to resist attack as in brushes?
These are just examples of the many ways in which the Catalin organisation has formulated specific resins to meet specific needs—resulting in greatly improved performance, longer product-life and lower manufacturing costs.
Whatever your "strength" problem, call in Catalin who will gladly 'get to grips' with any project and work with you in developing it.

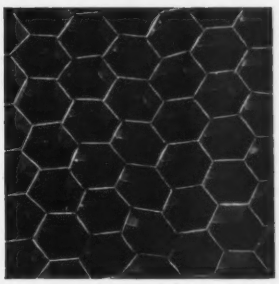
For this kind of service please write or telephone:

CATALIN INDUSTRIAL RESINS LTD

WALTHAM ABBEY, ESSEX. Tel: WALTHAM CROSS 3344

Manufacturers of Polyester, Liquid & Solid Phenolic, Resorcinol, Urea and Melamine Resins.

Catalin



ALUMINIUM HONEYCOMB FOR LIGHTWEIGHT STRUCTURES

One of many applications for Catalin adhesives.

VEHICLE BUILDING

Cast resin tools and fixtures. Polyester resin for reinforced structures. Foundry resins.

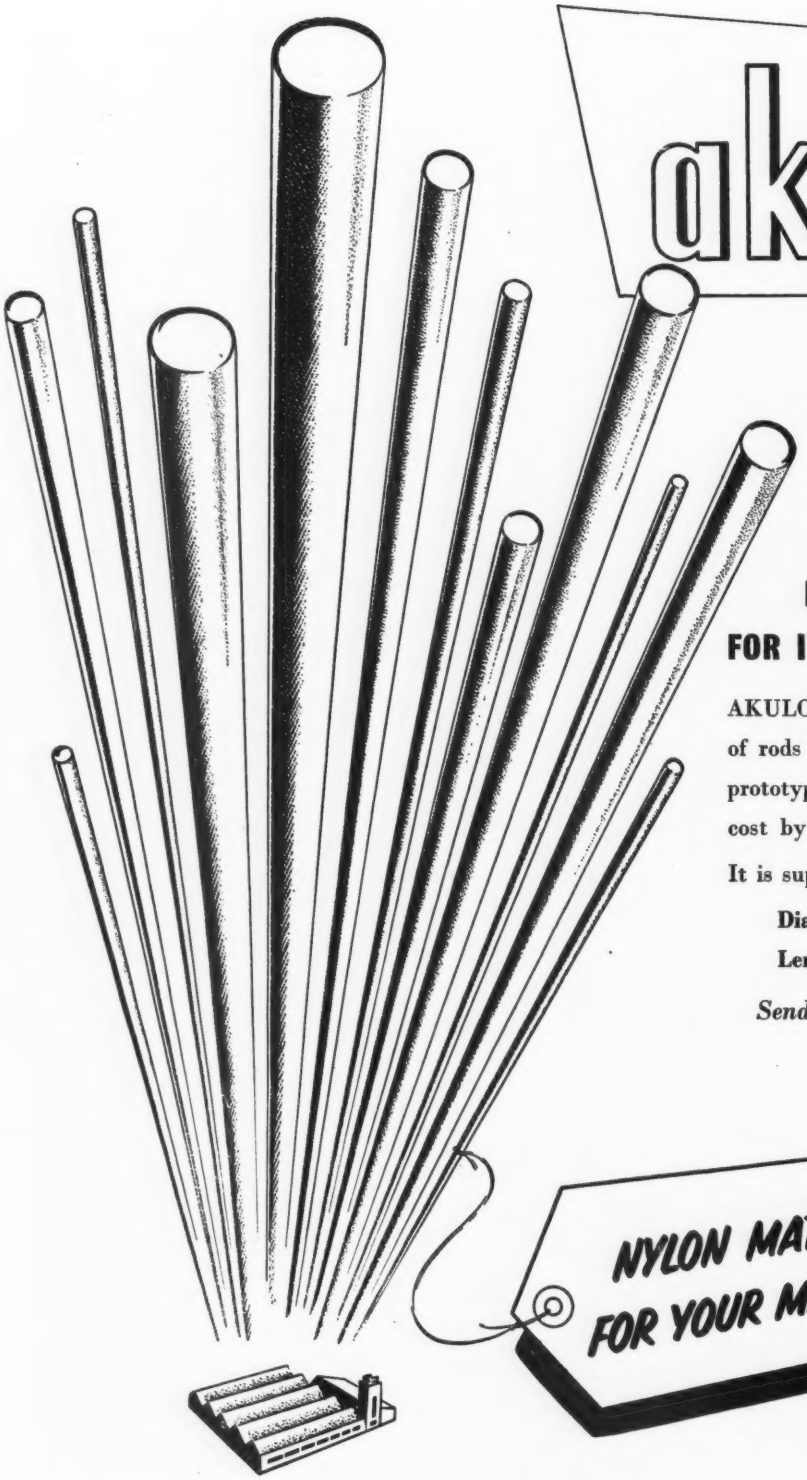
BRUSH SETTING

Typifying the solvent and chemical resistance of Catalin resins

SEE WHAT Catalin RESINS CAN DO FOR YOU

ASK FOR YOUR COPY OF **"THE RESIN REVIEW"**

akulon ROD



NYLON MATERIAL FOR INDUSTRIAL PURPOSES

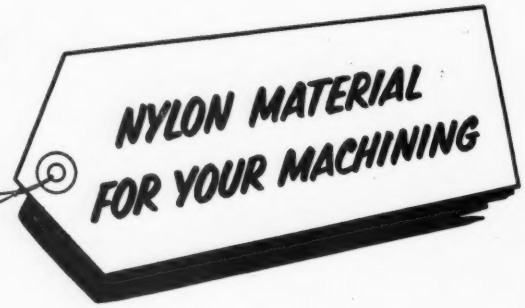
AKULON can be supplied in the form of rods suitable for the fabrication of prototypes or for production runs where cost by injection would be too great.

It is supplied in 20 sizes.

Diameter 6 mm. — 150 mm.

Length 1 metre.

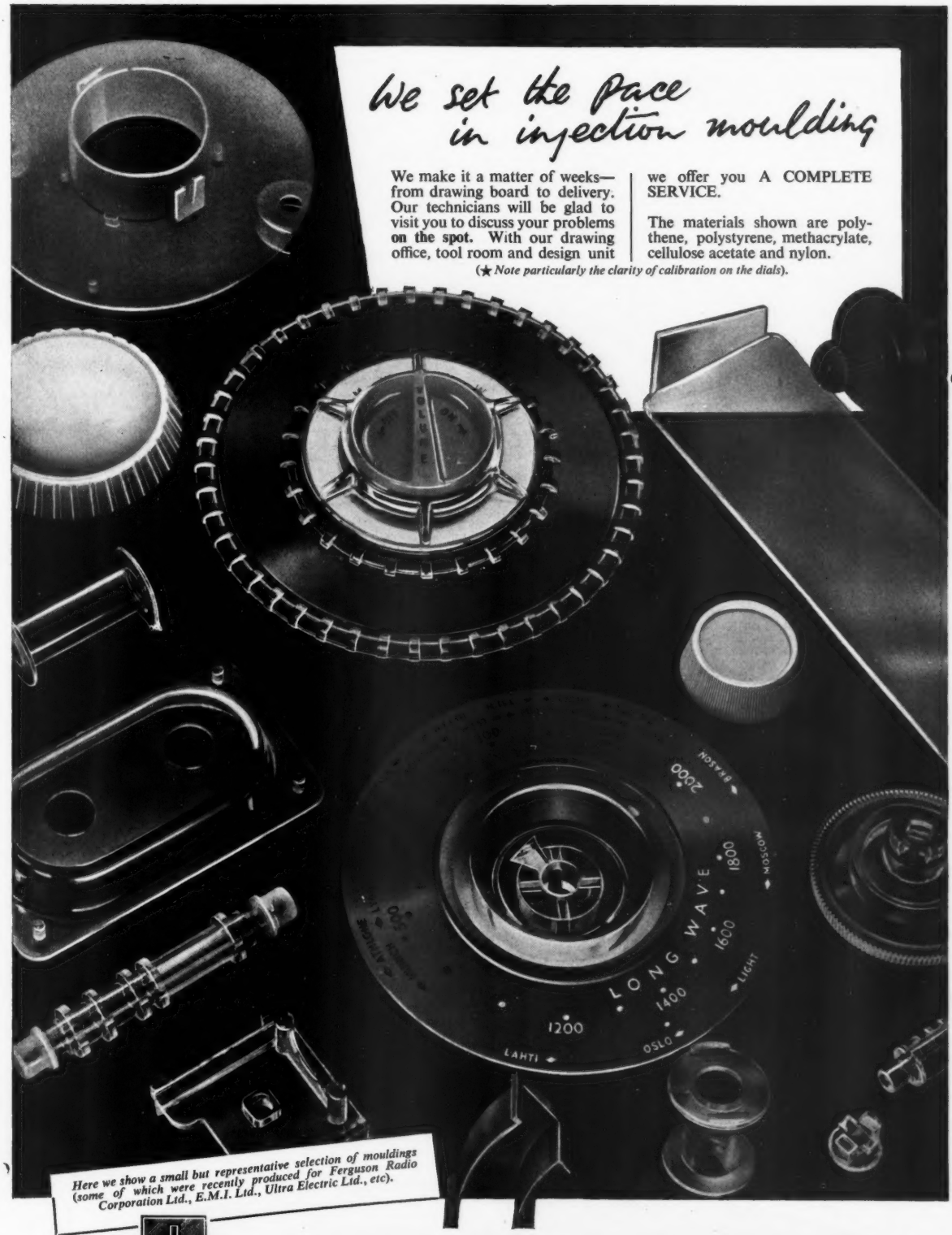
Send for full technical details.



SOLE DISTRIBUTORS

HERCULES POWDER COMPANY, LIMITED

140 PARK LANE, LONDON, W.1 Telephone: MAYfair 8711-5



We set the pace in injection moulding

We make it a matter of weeks—from drawing board to delivery. Our technicians will be glad to visit you to discuss your problems on the spot. With our drawing office, tool room and design unit we offer you A COMPLETE SERVICE.

The materials shown are polythene, polystyrene, methacrylate, cellulose acetate and nylon.

(★ *Note particularly the clarity of calibration on the dials*).

Here we show a small but representative selection of mouldings (some of which were recently produced for Ferguson Radio Corporation Ltd., E.M.I. Ltd., Ultra Electric Ltd., etc).

INJECTION MOULDERS *Ltd*

WESTMORELAND ROAD, THE HYDE, LONDON, N.W.9

Telephone: COLINDALE 8868/9 and 8860

IM43

AN ELECTRO-FORMED HARD-NICKEL DIE,

for injection moulding of Polythene Table Mats

(By kind permission of Messrs. V & E Plastics Ltd.)

* All intricate cavities for injection moulds are 'natural' uses for electro-formed dies. Please write for literature.

LONDON & SCANDINAVIAN METALLURGICAL CO LIMITED

CHELTON WORKS, GONSALVA ROAD, WANDSWORTH, LONDON, S.W.8.

MACaulay 5575 (5 lines)

Midland Representative: George F. Moore, 2 Augustus Road, Edgbaston, Birmingham 15. Telephone: Edgbaston 1854

Redifon

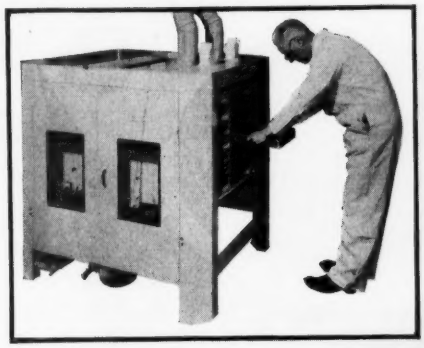
OFFER THE MOST COMPLETE RANGE OF WELDERS AND PRE-HEATERS IN THE WORLD

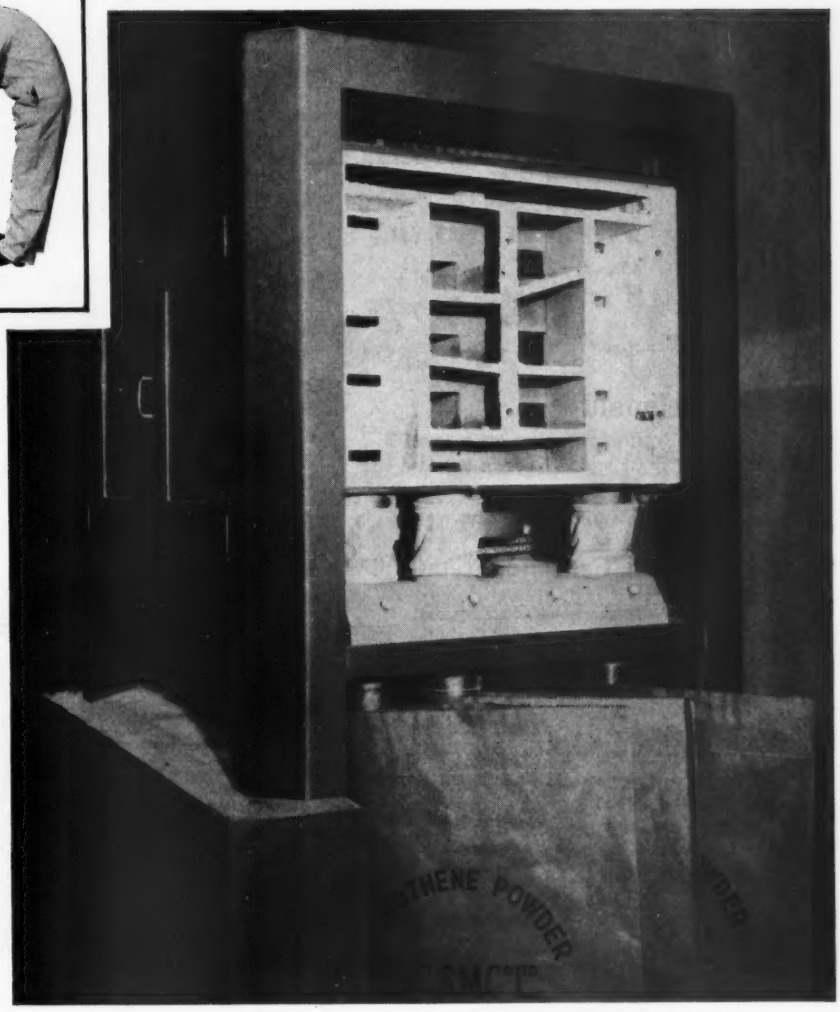
Redifon are in the forefront of every important development in this important field. Welding and embossing equipment, from 100 watts to 25 kW. is supplied for making everything from button holes in garments to complete car seats. Pre-heating equipment from 350 watts to 25 kW. Save money . . . increase profits . . . by these up-to-the-minute services to Industry.

EQUIPMENT FOR ALL BRANCHES OF THE PLASTICS AND ASSOCIATED INDUSTRIES

Industrial Electronics Division
REDIFON LTD., BROOMHILL RD., LONDON, S.W.18. Tel: VANdyke 7281. *A Manufacturing Company in the Rediffusion Group*

SIMPLIFIED, HIGH SPEED SIFTING OF MOULDING POWDERS with the Simon Junior Sifter





This Junior Sifter, installed at T. C. & M. Co. Ltd., has the side cover removed to show the internal sieving arrangement.

For trouble-free sifting of moulding powders, the Simon Junior Sifter will take a lot of beating. Big names in the plastics industry including Telegraph Construction and Maintenance Co. Ltd., find that Junior Sifters are ideal machines for high-capacity screening, grading and sifting.

The powerful rotary motion of the horizontal sieves gives positive separation with absolutely dust-free operation. Junior Sifters can be fitted with mechanical feeders or they can be incorporated into your existing processing system. Let us talk to you now about your sifting problems.

Industrial plant by **Henry Simon Ltd** SIMON ENGINEERING GROUP

STOCKPORT, ENGLAND

HS 191

L

MILTOID SALES

DEPARTMENT

BX PLASTICS LTD

A Subsidiary of the
British Xylonite Co. Ltd.

for

Celluloid
In sheets, clear transparent, white and black in standard size of 54" x 24" and in various thicknesses.

Bexoid Cellulose Acetate (REGD.)
In sheets, clear transparent, white and black in standard size of 54" x 24" and in various thicknesses.

Bexoid Optical Sheet
also special Transparent Range of 44 attractive colours (10/1000" thickness only)

Bexoid Film
In clear transparent only

BX Polystyrene
in sheets and rods

Cobex (REGD.) Rigid Vinyl Sheet

Velbex (REGD.)
In clear transparent and industrial black sheet. Velbex P.V.C. Transparent Beer and Industrial Hose.

Lampshade sheet
in Bexoid and Cobex

34-36 Royal College Street · London · N.W.1
Phone : EUSton 4146/7 · Grams : Celudol, Norwest, London

TA8314

Makers of Better Plastics rely on

VICTOR BLAGDEN CHEMICALS

for the Plastics Industry

PHENOL 39/41°

META CRESOL

Manufactured by
P. R. CHEMICALS LTD., Silvertown

FORMALDEHYDE

Manufactured by
The B.N.R. COMPANY, Barking

Enquiries to the Sole Selling Agents:—

VICTOR BLAGDEN & CO. LTD.
PLANTATION HOUSE, MINCING LANE, LONDON, E.C.3
Telephone : MANsion House, 2861 (6 lines)
Telegrams : BLAGDENITE FEN, LONDON
Norwich Union Building, City Square, Leeds. Telephone : 28236

Ask Crystalate to quote for Moulded Plastics

COMPRESSION
TRANSFER &
INJECTION
MOULDINGS
INC. NYLON

CRYSTALATE LTD.
ASSOCIATING
MICA PRODUCTS LTD.

ALSO—
S R B P TUBES
BOBBINS
&
FORMERS

CRYSTALATE HOUSE, TONBRIDGE, KENT. PHONES TONBRIDGE 2261/5 (25 LINES)

56 years experience at your service

PCL

PURE CHEMICALS LIMITED
PLASTICS DIVISION

Announcing the

FERROCLERE
VINYL STABILIZERS

Ferroclere 182	**Barium**	*Ferroclere* 541A	**Light Stabilizer**
Ferroclere 203	**Cadmium**	*Ferroclere* 1203	**Plastisols**
Ferroclere 700	**Zinc**	*Ferroclere* 1206	**Calendering**
Ferroclere 900	**Epoxy**	*Ferroclere* 1825	**Rigids**
Ferroclere 903	**Organic**	*Ferroperm* A	**Flooring**

Ferroclere 1820 **Barium/Cadmium Laurate**

Samples now available. Bulk production at Liverpool under licence from Ferro Chemical Corporation, Bedford, Ohio.

Have you a copy of
The New Stanclere price list?
The Ferroclere handbook?

PURE CHEMICALS LTD · PLASTICS DIVISION · KIRKBY INDUSTRIAL ESTATE
NEAR LIVERPOOL · OUR NEW TELEPHONE NUMBER IS SIMONSWOOD 2875

Moulds by Experts.

TOP PORTION OF 36 IMP. STRIPPER PLATE MOULD FOR 2¼" CAP CLOSURE WITH STANDARD JAR THREAD.

MOULDINGS ARE SPRUNG OFF THREADED PUNCH.

★H.B.SALE LTD.

PROGRESS WORKS, SUMMER LANE, BIRMINGHAM, 19

Established 1863 TEL.: CEN. 5661/3 GRAMS.: SALE, B'HAM Member of G.T.M.A.

PIONEERS

They say the West is pretty well opened up today . . . few places left to discover. Pioneers are out of date.

But in the field of plastics it's a different story. As plastics replace traditional materials new problems of bonding and drying are created—problems which the Spooner organisation is constantly being asked to solve. The outstanding success of Spooner machines for new heat treatments—from setting nylon stockings to fusing heavy conveyor belting—is the outcome of Spooner pioneering.

And that's worth remembering next time you have drying problems to solve.

SPOONER
REGISTERED TRADE MARK

THE SPOONER DRYER & ENGINEERING CO. LTD.

MOORLAND ENGINEERING WORKS, ILKLEY, YORKS, ENGLAND

Telephone: ILKLEY 1771 (3 lines) Telegrams: ILKLEY 1771 Cables: SPOONER, ILKLEY, ENGLAND

BAND & CARTRIDGE HEATERS

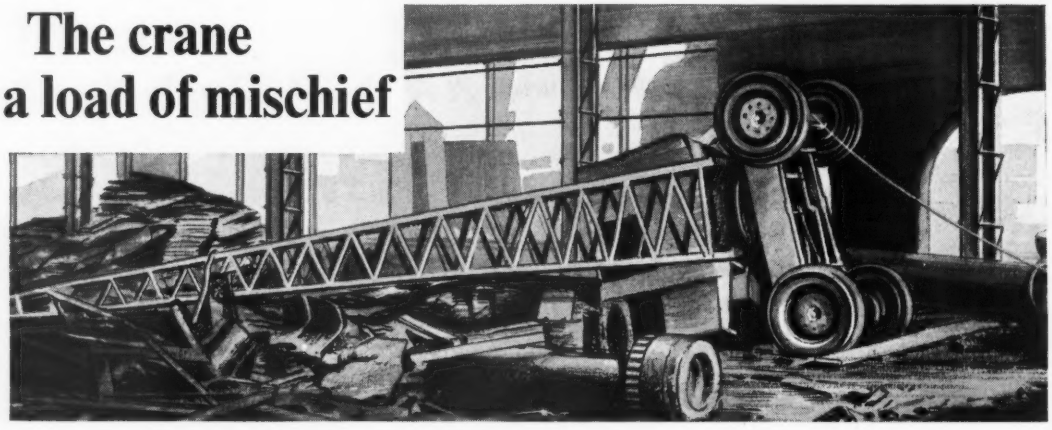
for the
PLASTICS INDUSTRY

MICA-WOUND BAND HEATERS MADE FROM BEST QUALITY MATERIALS. SUITABLE FOR EXTRUDERS, DIES, BARRELS AND MOULDING PRESSES. LAGGING CASES ASBESTOS MATTRESS FILLED. OUR ENGINEERS WILL DISCUSS YOUR PROBLEMS ON SITE.

PHONE 52148 **GENRISTO** *LTD.* OSMASTON ST. NOTTINGHAM

VULCAN INSPECTS—AND PROTECTS

The crane with a load of mischief



RAISING a load of scrap just so far was one thing. But raising it that extra foot or two was another, and what with the increased acceleration and the jib angle, this mobile monster simply fell flat on its face.

What Vulcan say about it

No crane, mobile or otherwise, can be expected to do more than the lifting job for which it was designed. If it does, then accidents will happen, as sure as our name's Vulcan. Our Engineer-Surveyors scent danger before disaster, and industrial machinery is their happy hunting ground. Everything, from a boiler to a vacuum vessel, comes under their expert eyes and receives that specialist scrutiny for which Vulcan is renowned. That's why safety first is Vulcan first.

FREE: For news of industrial accidents and ways to avoid them, ask us for 'Vulcan,' a quarterly journal for Power users. Please write to Dept. 11.

THE
Vulcan
BOILER & GENERAL INSURANCE CO. LTD
67 King Street, Manchester 2

NEW HOSE FOR A CANADIAN PRINCESS

During the initial trials of the new train-ferry "Princess of Vancouver", built on the Clyde by Alexander Stephen & Sons Ltd., for the Canadian Pacific Railways Company, seven metallic flexibles in the main fuel fitted system failed because of vibration. They had to be replaced within sixty hours so that the ship could sail from Glasgow as scheduled. The Compoflex Advisory Service was asked to solve the problem. Within forty-eight hours they had manufactured the necessary seven one-foot lengths of one-inch diameter of composite hose fitted with special flanged-end fittings. They were installed over-night between the main fuel pipe and the tubes of the cylinders—and the ship sailed on time!

We offer the only complete Advisory Service

on flexible tubing and hose. As suppliers of all types and in all materials, we can recommend 'flexibles' best suited to a particular job, and at the right price.

• *if there is a 'flexible' answer, you'll find it at*

COMPOFLEX

COMPANY LIMITED

Flexible Centres at: 26 Grosvenor Gardens, London, S.W.1. Telephone: Sloane 6185/5109 · and Huddersfield Road, Oldham, Lancashire. Telephone: Oldham-Main 8144

BRITAIN'S ONLY FLEXIBLE CENTRES

FACTORIES AT OLDHAM AND SOUTH WIMBLEDON

TGA. G15

Have you a TUBE PROBLEM?

—*if so, let us solve it*

As a user of tubes — metal or otherwise — just consider whether or not a PAPER tube will do the job. Our paper tubes, **made of special quality paper, are impregnated with Thermo-hardening resins.** Strong, light in weight, they show a definite economy in cost. Used increasingly with every satisfaction in many industries. It will pay you to investigate this. Write to:

THE TEXTILE PAPER TUBE CO. LTD.
OAKWOOD MILLS · ROMILEY · NR. STOCKPORT
Telephone: Woodley 2271-4

..... and in my opinion, the question of repetition parts can be safely left in the capable hands of Griffiths, Gilbart, Lloyd. We trust that.....

Capstan and automatic work and sheet metal pressings in any metal, any finish, any quantity

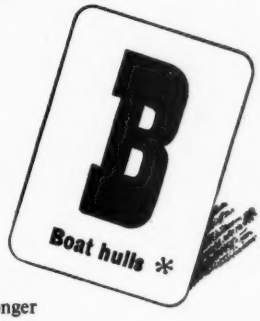
For quick service at the right price get in touch with

GRIFFITHS, GILBART, LLOYD & CO. LIMITED

EMPIRE WORKS, PARK RD., BIRMINGHAM, 18

Telephone: NORthern 6221

G·G·L



Easy to handle and simple to mould, Deeglas Chopped Glass Fibre Mat provides the extra strength needed to make plastic mouldings stronger and lighter. Its wide use in the aircraft, boat building and automobile industries is evidence of its outstanding advantages—even distribution of fibre, constant density and high tensile strength in all directions. Deeglas is available pre-impregnated with a variety of resins, and is suitable for moulding by either pressure or vacuum methods. Further details about Deeglas mat will be gladly supplied, along with samples of rovings, chopped fibre, and yarns.

Deeglas*

GLASS FIBRE MAT

FOR BETTER MOULDINGS

GLASS YARNS AND DEESIDE FABRICS LTD.

Craven House, 121 Kingsway, London, W.C.2, England
Telephone : Chancery 7343

Any METAL

Any GAUGE

Any MESH—

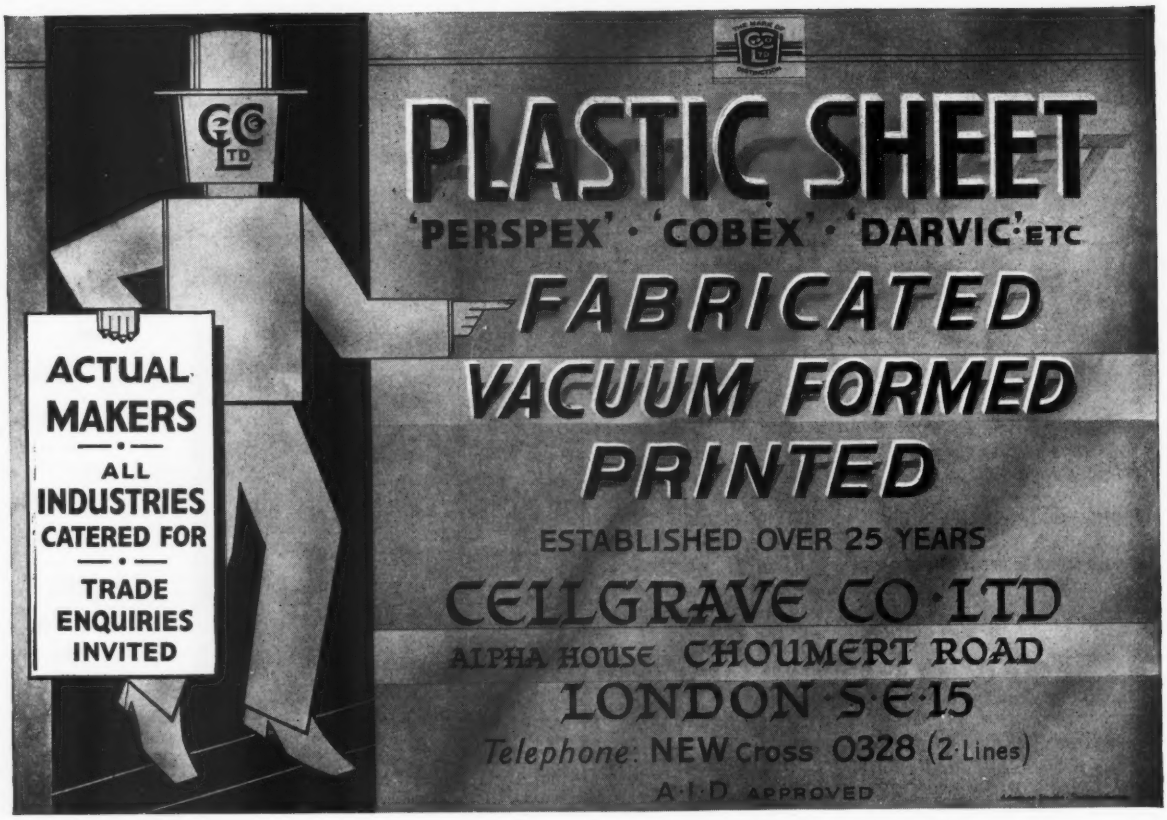
Made to an almost limitless range of specifications, 'Harco' Woven Wire provides a satisfactory solution to all screening and filtering problems.

'Harco' Woven Wire

ensures accurate control of quality, and maximum output over prolonged periods of service.
If desired, 'Harco' Wire Cloth can be supplied in non-corroding metals and alloys.
Please ask for Catalogue No. PS 269.

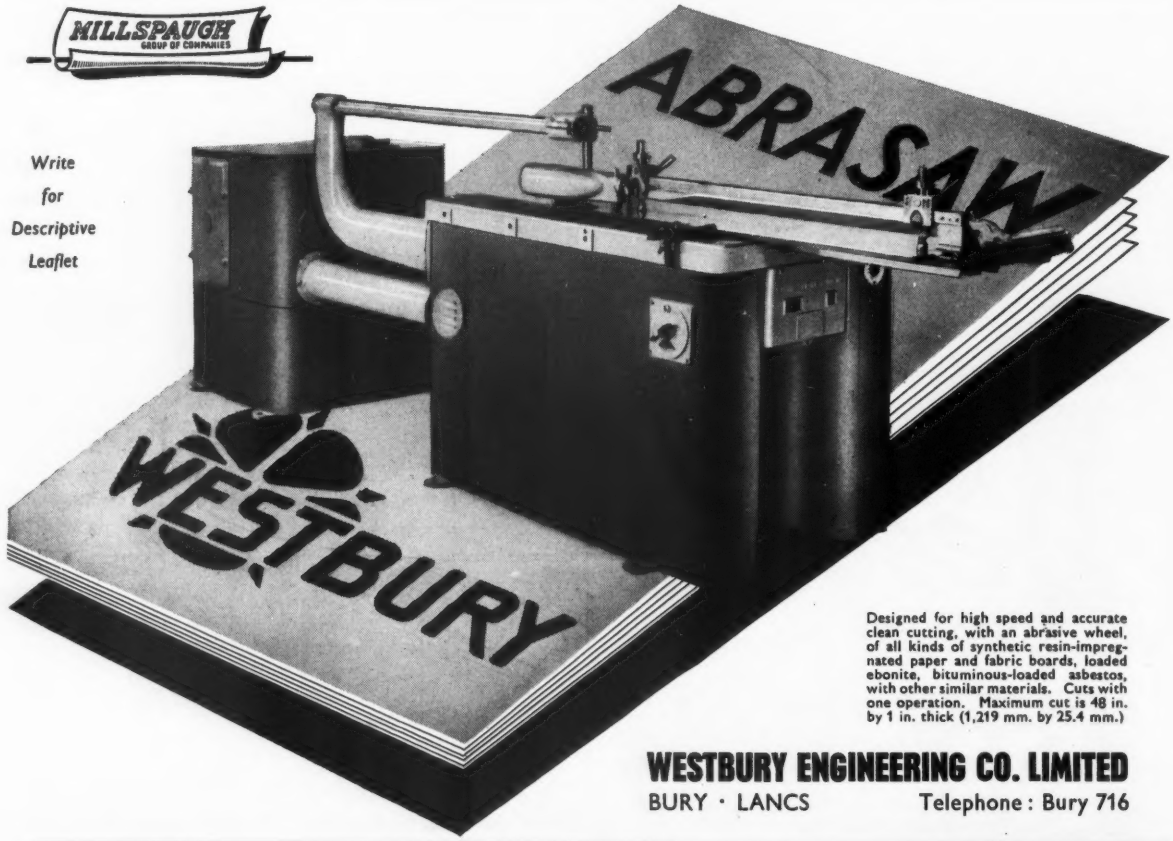
Harvey

G. A. HARVEY & CO. (London) LTD.
Woolwich Road, London, S.E.7. (GREenwich 3232, 22 lines)



MILLSPAUGH GROUP OF COMPANIES

Write for Descriptive Leaflet



Designed for high speed and accurate clean cutting, with an abrasive wheel, of all kinds of synthetic resin-impregnated paper and fabric boards, loaded ebonite, bituminous-loaded asbestos, with other similar materials. Cuts with one operation. Maximum cut is 48 in. by 1 in. thick (1,219 mm. by 25.4 mm.)

WESTBURY ENGINEERING CO. LIMITED

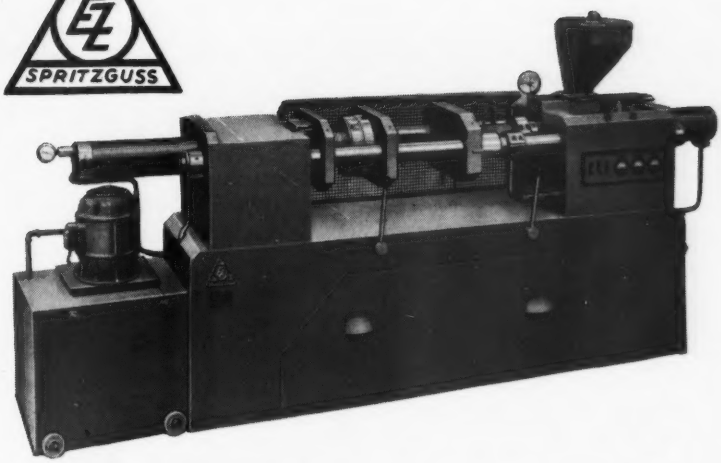
BURY · LANCS Telephone: Bury 716

EH 160—A NEW MODEL BY ECKERT & ZIEGLER

SPRITZGUSS

3 oz

INJECTION MOULDING MACHINE



★ Built-in oil hydraulic pump

★ Fully automatic or hand wheel control

★ Improved automatic feed

★ Automatic external heat control

For mouldings in polystyrene up to	3 oz.
Approx. plasticising capacity per hour (dependent on material)	13-17 lbs.
No. of shots (dependent on material and mould)	6-8 per min.
Area of injection plunger	2.2 sq. ins.
Total force on injection plunger	17.5 tons.
Size of die plates	21.6 × 11.8 ins.
Clearance between guides	12.9 ins.
Max. mould opening stroke	11.8 ins.
Max. mould locking force	80 tons

SOLE AGENTS ARPAL

ARPAL (ENGINEERS) LIMITED, ABFORD HOUSE, WILTON ROAD, LONDON, S.W.1. · Tel.: VICtoria 0783, 2785, 4990

Ferguson's

ASBESTOS FLOCK

MOULDING COMPOUND A 578/1

This material has strength, freedom from warping and can be preformed and moulded without difficulty. It also has the ability to absorb local shock by bruising.

You're right with 'NESTORITE'

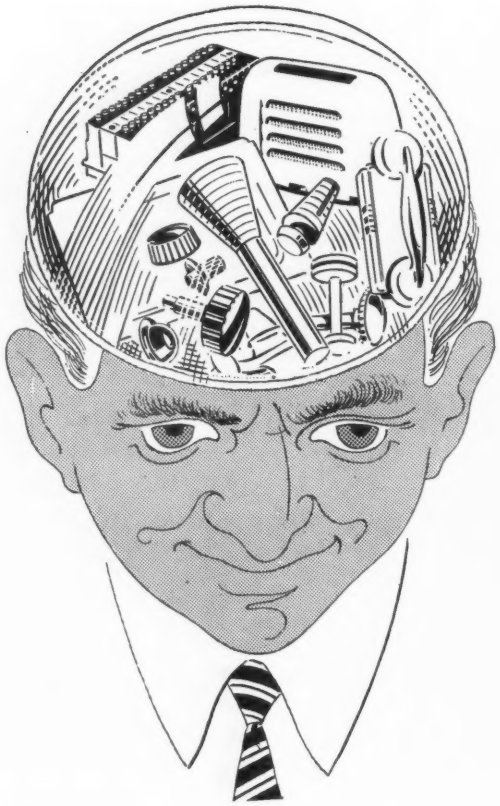
ASK FOR A 578/1 -

ASBESTOS FLOCK MOULDING COMPOUND MADE IN BLACK, BROWN & NATURAL BY . . .

JAMES FERGUSON & SONS LTD

PRINCE GEORGE'S ROAD · MERTON ABBEY · LONDON · S.W.19

Tel.: MITCHAM 2283 (5 lines) Grams: NESTORIUS, SOUPHONE, LONDON



have you a "plastic" mind?

There are so many ways in which moulded plastics can help to make better and more acceptable products... to simplify assembly... to save time and effort, and therefore cost ...that industry is becoming more and more "plastic" minded. KM have a fine reputation for first-class work and first-class service. Their mouldings are used everywhere; in electrical and radio equipment; in aircraft and public services; in toys, sports and fancy goods, and in a host of other articles.

KM engineers will gladly investigate your own needs and give you reliable advice.

KENT MOULDINGS

PROPRIETORS HOLSTER BRANDES LIMITED

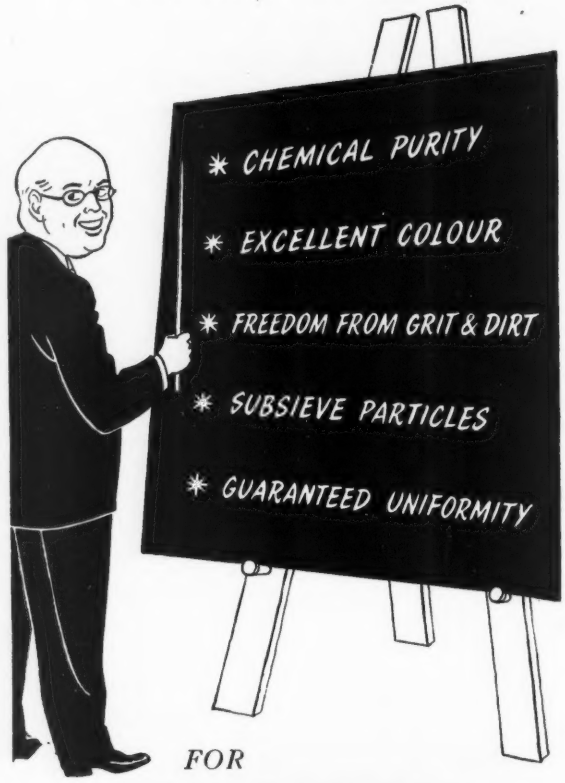
FOOTSCRAY · SIDCUP · KENT Tel.: Footscray 3333

AN ASSOCIATE

KM FOR MOULDINGS THAT MATTER

STURGE

PRECIPITATED CALCIUM CARBONATE



FOR

P.V.C. COMPOUNDS
P.V.C. PASTES
POLYESTER RESINS
EPOXIDE RESINS

Grades Available

CALOFORT (ultrafine, "activated" stearate-coated and uncoated, with ultimate particle size below 0.1 microns)

CALOFIL (low oil absorption, surface-coated and uncoated)

CALOPAKE (high oil absorption, high opacity, surface-coated and uncoated)

STURCAL (medium oil absorption in a wide range of particle sizes)

Write for Technical Leaflets to:

JOHN & E. STURGE LIMITED

1 Wheeleys Road · Birmingham 15

Telephone: Midland 1236/7

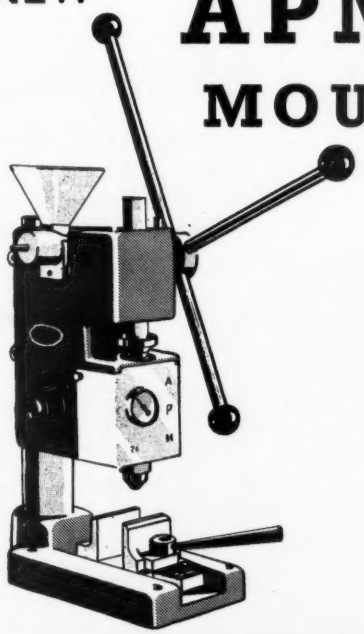
Manufacturers of fine chemicals since 1823

STURGE PRODUCTS

PCC 14

NEW

APM 21 HAND OPERATED BENCH INJECTION MOULDING MACHINE



★ SUITABLE FOR WORKING THERMOPLASTICS—CELLULOSE ACETATE, POLYSTYRENE, POLYTHENE, P V C, etc. with normal cylinder—NYLON with special cylinder.

★ FITTED WITH SEMI-AUTOMATIC HOPPER FEED.

★ CAPABLE OF PRODUCTION RATES, depending upon mould design UP TO 100 INJECTIONS PER HOUR WITHOUT SPECIAL SKILL.

AND TWO TOTALLY NEW FEATURES!

★ FITTED WITH NEW LEAK-PROOF, SELF-SEALING AND INTERCHANGEABLE CYLINDER UNIT (Patented).

★ CAPABLE OF ACCOMMODATING MOULDS OF VARYING SIZES IN NEW QUICK-ACTING CAM-LOCK VICE.

ASMIDAR PLASTIC MOULDING MACHINES LTD.

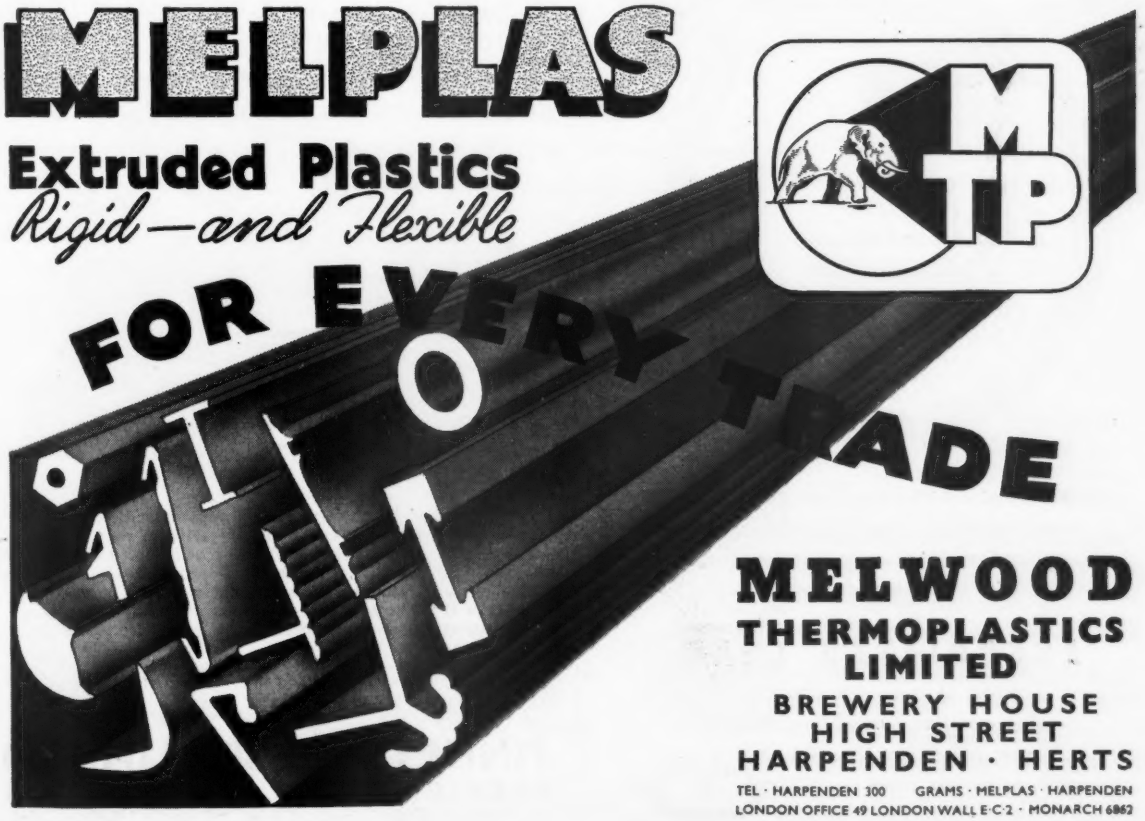
5 RAMPAYNE STREET, LONDON, S.W.1 Telephone : VICtoria 5555 (3 lines)

MELPLAS

Extruded Plastics

Rigid—and Flexible

FOR EV ERY TRADE



M TP

MELWOOD THERMOPLASTICS LIMITED

BREWERY HOUSE
HIGH STREET
HARPENDEN · HERTS

TEL · HARPENDEN 300 GRAMS · MELPLAS · HARPENDEN
LONDON OFFICE 49 LONDON WALL E·C·2 · MONARCH 6862

PIGMENTING TYPES

BASIC LEAD CARBONATE
—specially prepared for P.V.C. Supplied only as dispersed paste with Plasticisers to choice.

DIBASIC LEAD PHOSPHITE

TRIBASIC LEAD SULPHATE

A complete system available for heat, light and dielectric requirements

Stabilisers for P.V.C.

TRANSLUCENT TYPES

LEAD SILICATE

DIBASIC LEAD STEARATE

LEAD STEARATE

CADMIUM STEARATE

CALCIUM STEARATE

BARIUM STEARATE

LITHIUM STEARATE

With the exception of White Lead (Basic Lead Carbonate), these Stabiliser/Lubricants are supplied dry, or as non-settling dispersions which facilitate easy mixing and efficient intimate contact with P.V.C.

ASSOCIATED LEAD

MANUFACTURERS LIMITED

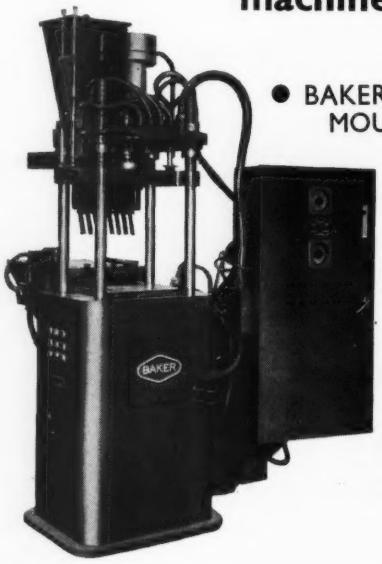
SPECIAL CHEMICALS DIVISION, CRESCENT HOUSE

NEWCASTLE UPON TYNE 1, ENGLAND

ASSOCIATED LEAD PRODUCTS

FINNEY HYDRAULICS

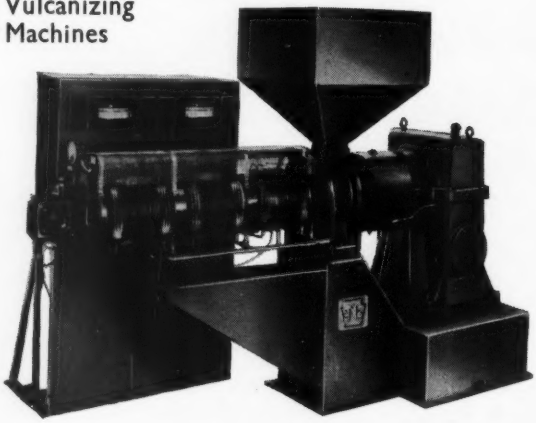
present 2 of the World's finest machines . . .



● BAKER AUTOMATIC MOULDING PRESS

The complete answer to high production at low cost. A trouble-free machine with speed and versatility of operation which automatically performs every known function in automatic moulding. 15-, 25-, 50-, 75-, 100- and 150-ton Range offers complete flexibility and covers every job—big or small

● Davis-Standard Plastics and Rubber Extruding and Continuous Vulcanizing Machines



Davis-Standard Extruders ensure high-velocity extrusion, maximum operating efficiency and are available with accessory units which mean satisfying, profitable production. Outstanding features include: 1, "Therma-Fin" patented Heating and Cooling; 2, Advanced Design Stream-Flo Head. From pay-off to take-up; everything is available, including Continuous Vulcanizing equipment embracing the new motorised mobile splice box.

Let our engineers advise you on the soundest and most efficient installation for your operation.

FINNEY PRESSES LIMITED

BERKLEY STREET, BIRMINGHAM, 1

Tel: MIDland 3795 (2 lines) Cables: "FINHYD" BIRMINGHAM

HARRIS—*the Plastic Scrap People*

You are assured of fair prices, speedy collections and prompt payments if you offer your

"Perspex" Acrylic
Cellulose Acetate
Cellulose Nitrate
P.V.C. and all other
Thermoplastic Scraps

to

HARRIS PLASTICS (Richmond) Ltd.

MANOR PARK · RICHMOND · SURREY

Phone: 0028/9

A selection from the many mouldings of quality by Hellermann Limited

1 Shows a very intricate and difficult moulding in translucent nylon with steel and brass inserts of a coil former for magnetic relays. We would mention that two reputable injection moulders pronounced this as an impossible proposition for injection mouldings. It is nevertheless now being successfully produced by us in quantity.

2 Coil Former in Clear Polystyrene for Radios. This moulding has 34 fine pitch internal threads and is produced within very close tolerances.

3 **4** **5** **6** Component parts for coil former assembly in heat resistant polystyrene.

7 Control knob for radio and television in clear polystyrene.

8 Battery cap in clear polystyrene.

9 Screw cap for battery top in red cellulose acetate.

10 Pick-up rest in brown high-impact polystyrene.

11 **12** Control knob for radio in brown polystyrene.

13 Miniature battery holder in polystyrene.

14 Electric iron indicator lamp cover in green transparent cellulose acetate.

Full details of these and other Hellermann Products readily available on request.

HELLERMANN LIMITED · CRAWLEY · SUSSEX · Tel.: Crawley 2000/1/2/3/4

E·M·I

HIGH FREQUENCY HEATERS

FOR THE PLASTICS INDUSTRY

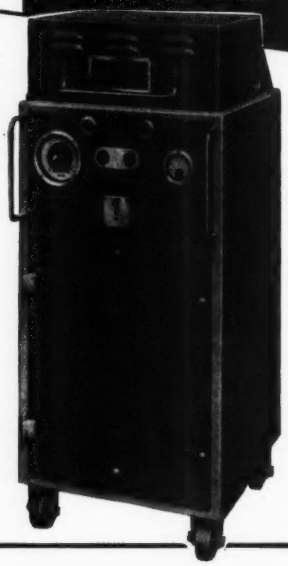
The special features of the E.M.I. Radio Frequency Heaters are:

- ★ Low running and maintenance costs.
- ★ Immediate servicing facilities.
- ★ Simplicity of operation.
- ★ Versatility.
- ★ Robustness.
- ★ Backed by sound technical advisory service.

RFH/1 *(Illustrated right).* 1 Kw. (58 BTU per minute). Oven will handle 2 lbs. powder. Heating rate 12 ozs. G.P. Moulding Powder per minute through 100°C.

DH 35A & B *(Illustrated left).* 3½ Kw. (200 BTU per minute). Oven size 18" x 18". Heating rate 2½ lbs. G.P. Moulding Powder per minute through 100°C. Available with either single or dual timer control panel.

For full details of H.F. Heating equipment:-



E.M.I. ELECTRONICS LTD. HAYES, MIDDLESEX. Telephone: SOUTHALL 2468 Ext. 473

EP.61

Can we help you?

True texture and consistently high quality have long been characteristic properties of Haigh stearines. Our products are backed by technical superiority built up over 70 years in the trade. Ask for samples to suit your production needs.

HAIGH FOR A1 QUALITY

JOHN HAIGH & COMPANY LIMITED
CLAYFIELD OILWORKS · SLAITHWAITE · YORKS.
Telephone: SLAITHWAITE 266/267. *ESTABLISHED 70 YEARS*
JH/58

Elm Plastics LIMITED

Solely Moulders to the trade, Tool-makers, Injection Moulders, Slash Moulders, offer capacity from 1 to 16 oz. in Styrene, Cellulose Acetate, soft, semi-rigid and rigid P.V.C., Alkathene and Diakon. Virgin materials only.

Elm Plastics Limited

RAINHAM, GILLINGHAM, KENT

'Phone: Rainham, Kent, 81447

"GYP"

REGISTERED TRADE MARK

THE PLASTICS DIVISION OF

HIGH PRESSURE COMPONENTS LTD

announce the production of a

FULL RANGE OF FULLY REUSABLE PIPE COUPLINGS

SUITABLE FOR USE WITH

NYLON, POLYTHENE, P.V.C. (Plasticised & Unplasticised)

in the range from 3/16 in. to 6 in. outside diameter

These Couplings are made in **NYLON, P.V.C., Light Alloys, Steel, Brass, etc.**

HIGH PRESSURE COMPONENTS LIMITED

PLASTICS DIVISION

"SUNFLEX WORKS," COLHAM MILL ROAD, WEST DRAYTON, MIDDLESEX

Telephone: West Drayton 2226-7-8

If you want A BETTER MIXER it pays to instal HOBART

The Hobart Mixer is world-renowned for efficiency, reliability and adaptability. It's epicycle action brings mixing to perfection — a fact established by the wide use made of Hobart by many different trades. A practical demonstration in your own works will convince you of the superiority of Hobart—let us arrange this without any obligation to you.

HIRE PURCHASE—Charge only 3%. Completely financed by Hobart—no third party concerned.

The illustration shows the AE200 Hobart Mixer which has a 20-quart capacity. Other Hobart Mixers are 10, 12½, 30, 50 and 80 quart capacity.

Hobart

THE HOBART MANUFACTURING COMPANY LTD

HOBART CORNER, NEW SOUTHGATE, LONDON, N.11 Tel.: ENTerprise 1212

Divisional Offices & Service Depots at: BELFAST 45770 · BIRMINGHAM: Midland 0715 · BRISTOL 20208 · CARDIFF 30546
DUBLIN 77212 · GLASGOW: Shettleston 3471/2 · LEEDS 27665 · LIVERPOOL: Stoneycroft 7274
MANCHESTER: Ardwick 1169 · NEWCASTLE-on-TYNE: Low Fell 7-5279 · NOTTINGHAM 84771

M

Factory efficiency in your library

In these times of industrial competition, full efficiency is vital—from every department, including the library; don't clutter it up with mixed piles of technical journals.

There is now no excuse for not having *Plastics* clean and readily available at all times in one of these handy Easibinders.

Finished in full-bound leathercloth, with *Plastics* title on the spine, each Easibinder will hold up to twelve average copies of the journal, each of which can be opened out quite flat for easy reference. Flexible steel wires hold each copy securely and no tools are required for either inserting or removing individual issues of *Plastics* from the binder.

PRICE 12s. 6d. EACH, POST FREE

ORDER FORM for EASIBINDERS

TO: TEMPLE PRESS LIMITED, Bowling Green Lane, London E.C.1

Please supply.....EASIBINDER(S) for Plastics

NAME.....

ADDRESS.....

.....

Remittance for.....enclosed, being 12s. 6d. for each binder.

PLASTICS FOR INDUSTRY?

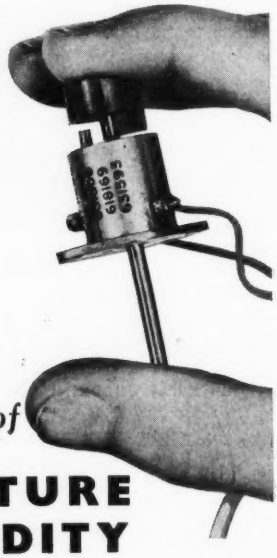
RMP

HAVE the experience AND the equipment

Compression and Injection Mouldings
Sawn and Machined Parts
PERSPEX and P.V.C. Mouldings
Laminated Tubes, Angles and Channels

RESINOID & MICA PRODUCTS LTD
MARY ST · BIRMINGHAM 12 · Tel Calthorpe 1303
LONDON 28 Queen Anne's Gate S.W.1 Tel WHitehall 8892
One of the group of companies associated with the Southern Areas Electric Corporation Limited

TEM-CON



The Accurate, Adaptable and Inexpensive Electronic System of

TEMPERATURE and HUMIDITY CONTROL

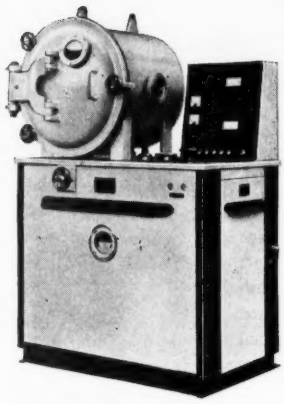
Sole Manufacturers & Patentees

P.A.M. LTD.

MERROW · GUILDFORD · SURREY

One of the group of Companies associated with the Southern Areas Electric Corporation Ltd.

VACUUM 'METALLIZING'
IN THE LABORATORY AND FACTORY



A 24" metallizing unit available with static or rotary work holders.

We don't have to tell you that VACUUM 'METALLIZING' is now standard practice in the plastics and product-finishing industries, but what we do tell you is that it is in your interest to know about the many time-saving features and remarkable results achieved by the EDWARDS units.

- ★ Faster production cycles gained by advanced vacuum engineering design.
- ★ Easier loading.
- ★ Lustrous films can be deposited on to *unpolished* surfaces.
- ★ No polishing operations.
- ★ Beautiful coloured mirror effects can be produced with tinted lacquers.
- ★ Arresting three-dimensional effects by back-coating and lacquering moulded transparent plastics.

For better vacuum service . . .

EDWARDS HIGH VACUUM LTD

MANOR ROYAL · CRAWLEY · SUSSEX CRAWLEY 1500 (10 LINES) EDCOHIVAC CRAWLEY

You can make it lighter and stronger in **MICOR** *GLASS REINFORCED PLASTIC*

Whether your product is an everyday article like a tray or a complicated moulding to be used as an aircraft part or car accessory, it will be lighter and stronger than metal — weight for weight — if you mould it in MICOR glass reinforced plastic. It will also be corrosion-resistant and dimensionally stable under extremes of heat or cold. A technical representative will be pleased to call on request to discuss your requirements.

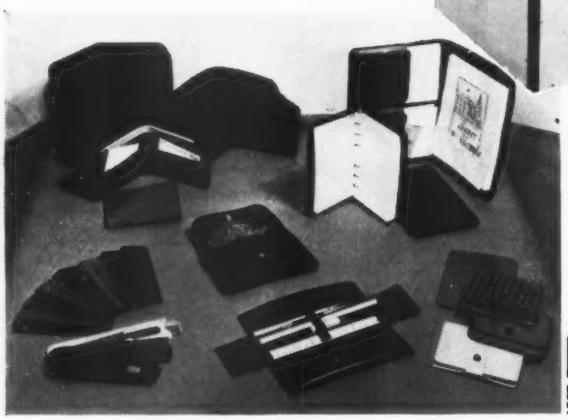
MICROCELL LIMITED

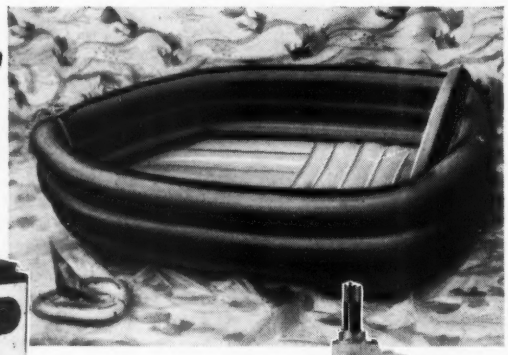
IMPERIAL BUILDINGS, 56 KINGSWAY, LONDON, W.C.2

Telephone: CHAncery 3424 (10 lines)

Make it easier WITH RADYNE

PLASTIC WELDERS





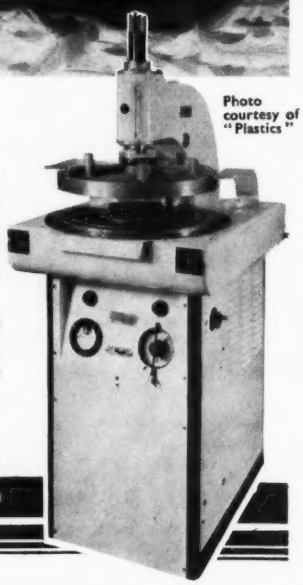


Photo courtesy of "Plastics"

The extensive range of RADYNE welders now includes both foot-pedal operated and pneumatically-operated machines of many types from ¼ to 6 kW output.

If you have any product in P.V.C. which can be welded, write for illustrated brochures and full particulars.

radio heaters ltd.

WOKINGHAM · BERKS · ENGLAND

For any of these materials . . .

- Acetate Sheeting
- 'Bexoid'
- 'Crinothene'
- 'Perspex'
- 'Rilfoil'
- 'PVC' Sheeting
- Polythene
- Lampshade Parchment
- Plastic Coated Papers
- 'Mistic' Adhesive

Samples and prices of these materials gladly sent on request.

speak to Spicers

SPICERS LIMITED (*Plastics Department*)
19 New Bridge St · London EC4 · Tel: Fleet Street 4211

PIONEERS IN **MOULDS** for MODERN PLASTICS also **PRESS TOOLS, JIGS & GAUGES**

BARBER & DUFFY LTD.
214/222 CARDIGAN ROAD · LEEDS
Phone: Leeds 52033

JOHN CASTLE & Co. Ltd.

STOCKISTS of Perspex Sheets, Virgin and Reground Cellulose Acetate, Polythene and Polystyrene Moulding Powders.

POLYTHENE, Polystyrene, Acetate and Perspex. We are sellers and buyers of these materials in any form.

GRANULATION and reprocessing plant available for:— Nylon, Cellulose Acetate, Polystyrene, Polythene and other Thermoplastic scrap. Materials ground to customers' requirements.

All enquiries to:—

JOHN CASTLE & Co. Ltd.
5 HURLEY ROAD, LONDON, S.E.11
Telephone: RELiance 4274/5

STEEL-SHAW jacketted

BALL MILLS

with porcelain linings

Successfully used for many years in the plastics industry, Steel-Shaw Ball Mills are your wisest choice for the grinding of plastic powders of all types. Speed, ease of operation, and efficiency, are but some of their attributes, which, from the manufacturer's point of view, mean increased productivity and top-quality products.

Robustly constructed and capable of staunchly withstanding the strain of constant use, Steel-Shaw Mills can be supplied in various sizes and fitted with discharge casings and insulated cooling jackets, if required.

"Steel-Shaw" ball mills are lined with porcelain blocks. Illustrated here with water jacket and discharge casing.

There's a STEEL-SHAW *answer to YOUR problem*

Write now for illustrated brochure

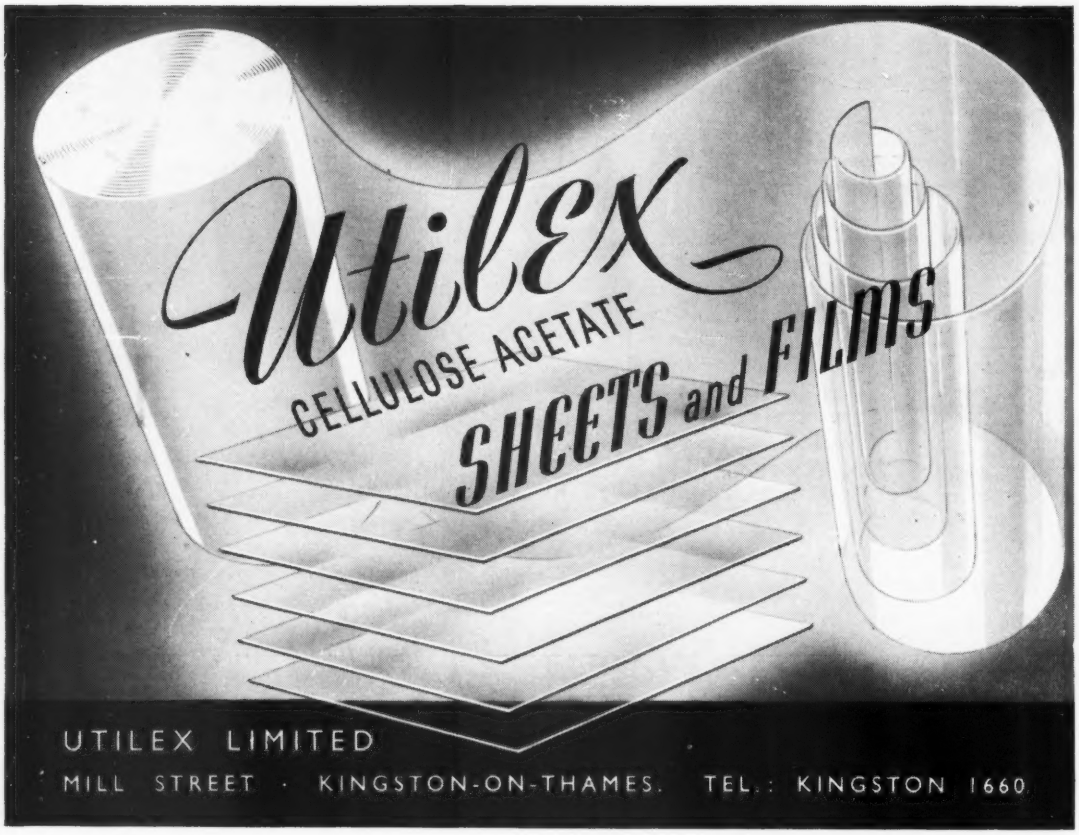
STEELE & COWLISHAW LIMITED

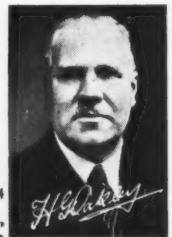
Head Office and Works: DEPT. 27
COOPER STREET, HANLEY, STOKE-ON-TRENT
Phone: Stoke-on-Trent 22109
London Office: 329 High Holborn, W.C.1 *Phone:* HOLborn 6023

sc/2999

Control Knobs

MOULDS AND MOULDINGS by **CASE DEVELOPMENT CO., LTD.**
KANGLEY BRIDGE RD. SYDENHAM S.E.26.



BRONZE POWDERS
IN ALL SHADES, FINENESS AND TEXTURES
FOR INJECTION MOULDING
DECORATIVE PRINTING FOR
PLASTIC SHEETING OR FILM
SPRAYING FINISHES FOR
PLASTIC GOODS, ETC.
Sample or patterns matched. Working samples gratis
GOLD, ANTIQUE BRONZE SHADES
COPPER AND SILVER PASTES
BRONZE AND ALUMINIUM PASTES MADE SPECIALLY IN YOUR SPECIFIED PLASTICIZER
"DIAMOND"
SILVER AND GOLD METAL TINSEL POWDERS
Gold and Silver Blocking or Stamping Foils
YOUR ENQUIRIES INVITED—HOME OR EXPORT
H. G. OAKLEY & CO. LTD.
SPECIALISTS IN THE PRODUCTION OF SPECIAL SHADES AND FINE QUALITY BRONZE POWDERS
DUROLUSTRE WORKS
THE MALTINGS,
LONDON COLNEY
HERTS.
EST. 37 YEARS
Telephone/Telegrams: BOWMANS GREEN 3233-3234
Stock depots: BIRMINGHAM, BRISTOL, HULL, LIVERPOOL, NEWCASTLE AND GLASGOW

49 years' experience in Bronze Powder Industry.

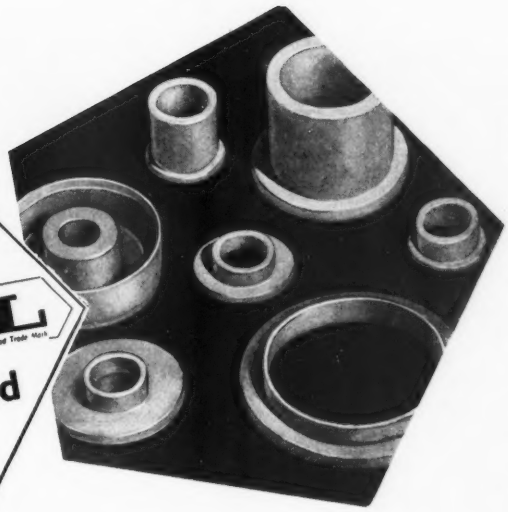
TRADE EMPIRITE MARK
Empire Plastics (BIRMINGHAM) Ltd
EMPIRE WORKS
BRUETON STREET
BIRMINGHAM · 4
Phone: ASTon Cross 2451
PLASTIC MOULDINGS FOR THE TRADE

EXTRUSIONS
are our business . . .
Not just a department
AS the leading specialists in this field our technical staff welcome enquiries for all types of extruded plastics. We can promise you also keen personal service and a completely satisfactory product.
C&C MARSHALL LTD
PLASTRIP HOUSE, OAKLEIGH ROAD NORTH, LONDON, N.20
Telephone: Hillside 5041 (3 lines). Telegrams: Tufflex, Norfinch, London
Cables: Tufflex, London

Bushes & Bearings

NYMOL

precision moulded in Nylon

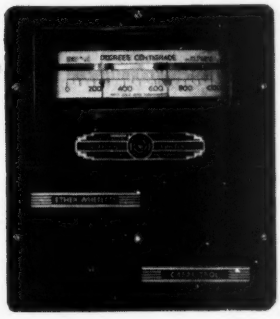


★ Nylon as a new engineering material, possesses, in high degree, the merits of Low Friction Coefficient, High Abrasion Resistance, and Resilience. In many cases it can also show appreciable cost advantage.

Plastic Engineers Limited

TREFOREST, GLAMORGAN

Telephones: Treforest 2371/2



Temperature control

ETHER

INSTRUMENTS

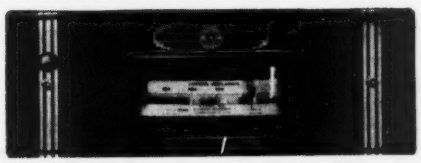
—at the speed of light!

for ON-OFF CONTROL

ETHER WHEELCO *ELECTRONIC* **"CAPACITROL"**

for STRAIGHT — LINE CONTROL

ETHER WHEELCO *ELECTRONIC* **"CAPACILINE"**



Most of the leading British and American Moulding Machines are fitted exclusively with Ether Wheelco Electronic Controls. The "Capacitrol" controls electrically heated nozzle temperatures with much greater speed and accuracy than the mechanically operated type of apparatus and eliminates under and over-shoot.

This instrument (Capacitrol EW 221) is fitted as standard to various Moulding and Extruding Machines.

The Ether Wheelco Electronic "Capaciline" is a proportional controller which will automatically maintain a furnace or other heated body at a set temperature.

There are also many types of Ether Surface Contact Pyrometers designed to measure quickly and accurately, the temperature of dies, etc., and to enable correct moulding temperature to be established.

ETHER LTD TYBURN RD · ERDINGTON BIRMINGHAM 24

Telephone : EAST 0276-7-8

PIONEERS OF INDUSTRIAL ELECTRONICS

ENGRAVING, FABRICATING, FORMING AND SHAPING OF PLASTICS FOR ALL TRADES

ESTABLISHED 1911

U.K. PLASTICS LTD

Associated Company: CELLULOID PRINTERS LTD.

KINGSTON BY-PASS, SURBITON, SURREY

Phone: ELMBRIDGE 2814/5 Grams: CELLUPRINT, SURBITON

Consult **SOUPLEX Limited**

WESTGATE · MORECAMBE · 'Phone 1717/8/9

A LARGE SINGLE-STOREY

FACTORY

SUITABLE FOR PLASTICS MANUFACTURE

REQUIRED

IN SURREY, WITHIN 10 MILES OF CAMBERLEY

GOOD HEADROOM ESSENTIAL

FREEHOLD PREFERRED

CHAMBERLAIN & WILLOWS

23 MOORGATE LONDON, E.C.2

METROPOLITAN 8001/8

M. CALDERON LTD.

SPECIALISTS IN

THE MANUFACTURE OF

HEATING ELEMENTS

FOR THE

PLASTICS MOULDING INDUSTRY

ALL ENQUIRIES TO HEAD OFFICE

SEBASTIAN HOUSE,

SEBASTIAN STREET, LONDON, E.C.1

CLE 1712/3

Wanted

STOCKS *for* CASH

We are cash buyers of merchandise of every description. Also Clearance Stocks, Discontinued Lines, Surplus and Redundant Stocks, **BOTTLES, Jars, Screw Caps, Cartons,** and other **Packaging Materials.** In fact, goods of all kinds can be disposed of through us without delay, on the most favourable terms, and without trouble.

Should you have anything for disposal either now or at any future time please send us samples, full particulars and price on a cash settlement basis and the matter will have our immediate and careful attention.

RELIANCE TRADING CO.

13, NEW COLLEGE PARADE, FINCHLEY RD., LONDON, N.W.3

Phone: PRIMROSE 5611 & 3167 *Grams:* "GORDON" PRIMROSE 5611

LY-BAK LIMITED RUBBER & PLASTICS MANUFACTURERS

THERMOPLASTICS

Cellulose Acetate · Polythene · Polystyrene
Aceto-Butyrate · P.V.C. and Co-polymer
Polystyrene/rubber compound

SOUTHERN INDUSTRIES AGENCY

(LONDON SALES OFFICE FOR THE GROUP)

FARADAY HOUSE, 8-10, CHARING CROSS ROAD, LONDON, W.C.2. Telephone: Covent Garden 2538

Virgin high acetyl and standard, cellulose acetate moulding powders. We are able to reprocess your redundant stocks and scrap into first class moulding powders. We would be pleased to make you an offer for your scrap. Prompt deliveries of virgin and reconstituted powders.

LET US SOLVE YOUR MATERIAL PROBLEMS—THERMOPLASTICS IS OUR BUSINESS

"LY-BAK PRODUCTS STAND UP TO THE JOB"

for
PLASTICS MACHINERY OF ALL TYPES

Including:
Two-roll Mixing Mills · Pre-form Tabletting Machines · Hydraulic Compression and Injection Moulding Presses · Extruders Pumps and Accumulators · Vulcanising Pans

Our range includes: Power Plant · Boilers Lifting and Mechanical Handling Equipment Protective Clothing

GEORGE COHEN (THE 600 GROUP OF COMPANIES)
SONS AND COMPANY LIMITED
Established 1834

WOOD LANE, LONDON, W.12
'Phone: Shepherds Bush 2070. 'Grams: Omniplant, Telex, London
STANNINGLEY, Near LEEDS
'Phone: Pudsey 2241. 'Grams: Coborn, Leeds

And at Kingsbury (Nr. Tamworth) · Manchester · Glasgow · Swansea · Newcastle · Belfast · Sheffield · Southampton · Bath

P/5412/HP68

"Yorkshire" *"POLYORC"* **PLASTIC TUBES**

in

"POLYORC A"—POLYTHENE—Tubes to B.S. 1972 and 1973
"POLYORC B"—P.V.C. (POLYVINYL CHLORIDE)—Unplasticised rigid type
"POLYORC C"—FLEXIBLE P.V.C.

In this modern age there are many developments in plant design which require pipelines to be made from materials which will withstand corrosive fluids and gases. We hope that this addition to the well-known range of "Yorkshire" Tubes and Fittings will help to give an even more comprehensive service.

The advantages of Plastic Tubes include:

- **Resistance to most acids, alkalis, corrosive fluids and gases**
- **Good electrical and heat insulation properties**
- **Light weight**
- **Good flexibility or hard, tough grades as desired**
- **Various colours or transparent**
- **Long lengths in flexible types**

Full particulars from:—

THE YORKSHIRE COPPER WORKS LTD · LEEDS & BARRHEAD

Are You Buying

B.L.C.
(EXPORTS) LIMITED

92 BAYLIS ROAD
LONDON S.E.1

TELEGRAMS · BALACA
TELEPHONE · WATerloo 3616-7

HOME AND EXPORT

the **RIGHT** *Quality at the* **RIGHT** *Price?*

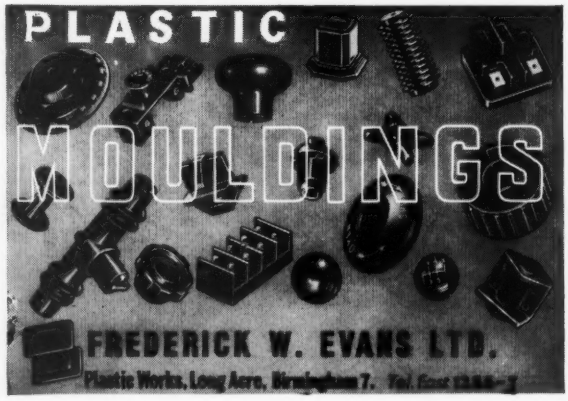
for **ALL THERMOPLASTICS**

CELLULOSE ACETATE · BUTYRATE
POLYSTYRENE · P.V.C., etc., etc.

DIXONS OF HALIFAX

★ **Wire Shapes**
FOR THE PLASTICS TRADE

ARTHUR DIXON & CO. LTD.
RAGLAN ST., HALIFAX, YORKS
Halifax 3339 & 5249
103 GEORGE STREET, CROYDON
SURREY Croydon 3814



Engraved Rollers for Printing and Embossing

T. G. MARTIN & CO. OLD COLONY HOUSE, 3, RIDGEFIELD, MANCHESTER 2.

BYSON
FOR
BAKELITE

Acetate and other Synthetic Mouldings, Modern Plant and Facilities.

APPLIANCE CO. LTD.,
WOOLFOLD, BURY, LANCS.
Telephone : Bury 1560-1 Telegrams : "Bysonite, Bury."

CARBAZOLE

A PLASTIC POTENTIAL
HIGHEST COMMERCIAL QUALITY

For Samples and Quotations

Apply to
Sales Dept: **L. B. HOLLIDAY & Co LTD HUDDERSFIELD**

The JUNIOR ROTARY CUTTER

This is the ideal Rotary Cutter designed to meet all demands, for a really robust yet small machine with a high performance.

The Junior is a product of specialists in Rotary Cutter design over many years, and is an addition to the range of well-known Masson Rotary Cutters.

The Junior Rotary Cutter is a self-contained unit with built-in granule collecting drawer, and is driven by a 1 h.p. motor mounted on framework.

The machine is quiet in operation and has been designed to ensure easy cleaning and maintenance. If desired the unit can be supplied suitable for bench or mobile mounting.

Please write for further details

BLACKFRIARS ROTARY CUTTERS LTD
BLACKFRIARS HOUSE NEW BRIDGE STREET
LONDON E.C.4
TELEPHONE: CENTRAL 6383-4
TELEGRAMS: PAPMILENG LUD LONDON

AERASPRAY

Application of Polyester and Epoxy Resins and similar fluids by the Aeraspray model GTH.10 Catalyst Spray Gun gives greatly reduced production costs. 'Pot Life' and premature gelling are eliminated by keeping catalyst and resin apart until application takes place. Tests carried out by large resin manufacturers and users prove evenness of gell coupled with high speed application.

AERASPRAY ASSOC. LD. *Makers of Air Compressors, etc.*
Head Works, Nechells, Birmingham, 7. *Phones: EASt 1671-4, etc.*

with the new sliding centre roll

The lastest feature of Pascall Triple Roll Mills is the new and simplified method of roll control—the sliding centre roll. Only two controls are used in place of the usual four, and clearances between the rolls are automatically aligned and set simply by adjusting the two front controls.

The new method of roll control is simple, effective and a real time saver. Demonstrations of the new method can be seen at our Test Station without obligation.

Write or telephone Paddington 7236 for list C.3210

PASCALL
ROLLER MILLS

THE PASCALL ENGINEERING CO., LTD., 114, LISSON GROVE, LONDON, N.W.1

PLASTIC SCRAP

Michael S. Stevens

Buyers at Your Works of Injection Scrap, Scrap Cuttings

KESWICK ROAD, LONDON, S.W.15
VANdyke 3345-6

SHORT BROTHERS & HARLAND LIMITED

require

PRODUCTION DEVELOPMENT ENGINEER

for interesting work on reinforced plastics with regard to aircraft components, jigs and fixtures, etc.

The work in the main is experimental and offers considerable scope to a person of integrity and ability.

Applicants should have a wide knowledge of plastic's techniques, with particular reference to casting and laminating thermosetting materials.

Pension scheme, assistance with housing in Northern Ireland and removal expenses thereto.

Apply in the first instance to Personnel Manager, P.O. Box 241, Belfast, stating qualifications, previous experience, age, etc., and quoting Ref. P.22.

Important Post for a Graduate Chemist

GEORGE ELLISON LIMITED require a Chemist of Degree Standard for an important and interesting post.

He will investigate the use of various materials in the manufacture of laminated plastics; he will have had a wide experience in the laminates industry.

Write, with full details of qualifications, experience and salary requirements, to the Personnel Manager.

TUFNOL
LIMITED

PERRY BARR BIRMINGHAM · 22B

448/CH

SMALL MOULDINGS

CAPACITY FOR LONG RUNS
ON

NEW INJECTION MOULDERS

(MOULDINGS UP TO 2 OZ.)

CELLULOSE ACETATE, POLYSTYRENE, ETC.

W. H. ADAMSON PLASTICS LTD.
39, HEDLEY STREET, MAIDSTONE

WM. WILLIAMSON & SONS
(KIRKCALDY) LTD., KIRKCALDY

WOODFLOUR

TEL.: 2068 (3 LINES) GRAMS: WILLIAMSON KIRKCALDY

Classified Advertisements

PRESS DAY.—Classified advertisements for the November issue must be received at Head Office by first post Tuesday, October 25.
Last-minute additions and deletions are accepted by telephone from trade advertisers up to noon. Advertisements received too late for a particular issue are automatically inserted in the succeeding one unless instructions to the contrary are received.

RATES.—4d. per word (minimum 12 words 4/-). Each paragraph charged separately and name and address must be paid for. Semi-displayed setting 35/- per single column inch. Series discounts of 5% for 6, and 10% for 12 consecutive insertions allowed to trade advertisers.

TERMS.—Strictly net and prepayable. Monthly accounts for settlement by the end of the month following insertion are allowed to trade advertisers if satisfactory references are provided.

REMITTANCES.—Cheques and postal orders should be crossed and made payable to TEMPLE PRESS LIMITED and instructions sent addressed to the Manager, "Plastics," Bowling Green Lane, London, E.C.1.

THE PROPRIETORS retain the right to refuse or withdraw advertisements at their discretion and are not responsible for clerical or printers' errors although every care is taken to avoid mistakes.

BOX NUMBERS.—Private advertisers desiring to have replies sent care of "Plastics" may do so on payment of 1/- to cover booking and postage, plus cost of four extra words. To avoid mistakes in forwarding, Box numbers should be carefully and legibly copied and replies sent to Box P000, care of "Plastics," Bowling Green Lane, London, E.C.1.

DEPOSIT SYSTEM.—Facilities are available to readers to purchase advertised goods on approval by depositing the purchase price with "Plastics." Full details on application. Commission 1% (minimum 2/-) on amount deposited.

HEAD OFFICES: Bowling Green Lane, London, E.C.1, England. Telephone: Terminus 3636. Telegrams: "Pressimus, Phone, London."

BRANCH OFFICES: 7, John Bright Street, Birmingham, 1. Telephone: Midland 4117-8. 50, Hertford Street, Coventry. Telephone: Coventry 62464. 1, Brazennose Street, Manchester. Telephone: Deansgate 6114-8 12, Renfield Street, Glasgow. Telephone: Glasgow Central 1413.

AUCTIONS

ESTABLISHED 1855.

EDWARD RUSHTON, SON AND KENYON,

INDUSTRIAL VALUERS, AUCTIONEERS AND FIRE LOSS ASSESSORS,

12 YORK STREET,

MANCHESTER, 2.

Phone, Central 1937-8.

Grams, Russonken, Manchester. zzz-486

BUSINESS OPPORTUNITIES

PROGRESSIVE COMPANY marketing plastic goods in the United Kingdom with excellent established distribution, offers service to manufacturers as sole distributors. All offers to Acro Marketing, Ltd., 9 Warwick Court, W.C.1. 223-1157

VACUUM FORMING CAPACITY AVAILABLE, together with full facilities for fabricating, engraving and printing of all plastic materials. Omega Plastics, Ltd., Highbridge Rd., Town Quay, Barking, Essex. 223-1158

RING THO 4950. For all your engraving needs. Dies, moulds and repetition engraving, etc. F. White and Son, 18 Lahore Rd., Croydon. 219-44

MANUFACTURERS of new proprietary lines wish to contact distributors with existing connections. Write Box P1927, care of "Plastics." 219-17

WANTED TO PURCHASE.

THE MARLEY TILE COMPANY LIMITED.

IS INTERESTED IN PURCHASING

A BUSINESS WITH GOOD MANUFACTURING

FACILITIES OF PLASTICS PRODUCTS.

MUST HAVE POSSIBILITIES FOR EXPANSION.

COMMUNICATE IN CONFIDENCE TO:—

THE MANAGING DIRECTOR,

THE MARLEY TILE COMPANY, LTD.,

RIVERHEAD,

SEVENOAKS, KENT.

219-5

WE OPERATE the most efficient and extensive distribution service for plastic products in Great Britain, with or without manufacturing facilities. Designers with ideas for exploitation and moulders, etc., having products, particularly those of interest to the hardware trade, requiring nation-wide distribution, should write in confidence to the Managing Director, Box P1327, care of "Plastics." 219-48

FINANCIAL AND PARTNERSHIP

ADVERTISER wishes partnership in moulding concern. Specialized knowledge injection moulding. Box P1938, care of "Plastics." 219-xA8496

MACHINERY, TOOLS AND PLANT

ALTERATIONS. Diesel sets, electric motors, switch gear transmission equipment, fluorescent lighting and industrial fittings ex stock, keen prices. Contact G. L. Murphy, Ltd., Manston, near Leeds. zzz-489

Machinery, Tools and Plant (contd.)

HYDRAULIC PRESSES.

Six 1,160-ton upstroke presses by Robertson and Orcher, glanded ram 33¼-in. dia. by 15-in. stroke, four columns 8 in. dia., distance between 7 ft. 1 in. by 17 in., semi-guided moving table and head with working area 6 ft. 5 in. by 4 ft., daylight 13¼ in., W.P. 3,000 lb. sq. in., fitted two C.I. platens 6 ft. 5in. by 4 ft. by 4½ in.

Seven 400-ton downstroke presses by Greenwood and Batley, ram 16-in. dia. by 30-in. stroke, W.P. 2 tons sq. in., four columns 5½ in. dia., distance between 22 in. by 17⅝ in., fully guided moving table, working area 31¾ in. by 22 in., daylight 54 in.

350-ton self-contained downstroke press by John Shaw, main ram 21-in. dia. by 29-in. stroke, W.P. 1 ton sq. in., four columns 5½ in. dia., distance between 36⅜ in. by 18⅛ in., fully guided moving table, working area 36 in. sq., pr. electric platens 36 in. sq., daylight 33 in., Hele Shaw pump, motorized 400/3/50.

285-ton upstroke multi-daylight platen press by Iddon, ram 19-in. dia. by 15 in. stroke, four columns 4½ in. dia., distances between 31½ in. and 13½ in., to head and table are fitted steam-heated platens 30 in. sq. by 2 in. thick with intermediate platens giving four daylights of approx. 4¾ in., platen W.P. 100 lb. sq. in., press W.P. 1 ton sq. in.

250-ton upstroke press, ram 18-in. dia. by 15-in. stroke, W.P. 1 ton sq. in., four columns 5⅝ in. dia., distance between 22½ in. by 18 in., semi-guided tee slotted table 30 in. by 14 in. by 9¾ in. deep, daylight 14½ in.

200-ton downstroke compression or transfer moulding press by Hydraulic Eng., main piston-type ram effective dia. 11-in. by 9¾-in. dia. rod by 12-in. stroke, fixed and moving tables each with working area 30 in. by 21 in. max., daylight 30 in., W.P. 2 tons sq. in.

160-ton downstroke press by E.M.B., ram 12-in. dia. by 13-in. stroke, tee slotted moving tables 26 in. by 19 in., daylight 16 in., ejector or transfer ram 5½ in. dia. by 6½-in. stroke, main pressing power 160 ton, mould breaking power 14 ton, ejector power 35 ton, W.P. 1½ tons sq. in., Towler electraulic pump.

GEORGE COHEN, SONS AND CO., LTD.,
WOOD LANE, LONDON, W.12.
Phone, Shepherd's Bush 2070.
AND
STANNINGLEY, NEAR LEEDS.
Phone, Pudsey 2241. 219-37

HYDRAULIC. Frazer Mono-radial pumps, new and second-hand in stock. Thompson and Son (Millwall), Ltd., Cuba St., London, E.14. East 1844. zzz-302

FOR DISPOSAL: One Buss Ko-Kneader type PR.200, with granulating head and all contact parts in stainless steel, 30 h.p. motor and starter, new 1952, excellent condition. May be seen by appointment on application to Chief Engineer, May and Baker, Ltd., Dagenham. Phone, Ilford 3060. 219-40

ONE HUPFIELD GRANULATING MACHINE, also one No. 1 Miracle Mill complete with Brook 25 h.p. squirrel-cage 3-phase motor with Vee-rope drive mounted on slide rails, Ellison star delta starting equipment; this machine is ideal for breaking up large pieces of plastic scrap. Box P1923, care of "Plastics." 219-20

TWO 84-IN. BERSTORFF MIXER MILLS, steam heated for plastic work and complete with 250 h.p. gearbox and motor. Box P1929, care of "Plastics." 219-16

PLASTICS MACHINERY.

Hydraulic Presses of all sizes. Injection Machines. Extruders. Mixing Mills. Hydraulic Pumps and Accumulators.

Send your requirements to the specialists.

REED BROTHERS (ENGINEERING), LTD.,
REPLANT WORKS,
CUBA STREET, MILLWALL, E.14.
Phone, East 4081 (five lines). 219-15

Machinery, Tools and Plant (contd.)

FIVE 3-OZ. T.M.A. FOR SALE, excellent condition, can be seen working by appointment, price £250 to £450. Stewart Plastics, Ltd., Purley Way, Croydon, Surrey. 219-1

NEW HIGH-SPEED ELECTRIC BANDSAWS for sale, for cutting polythene, P.V.C., rubber, Perspex, cork, leather, cloth, etc. Stainless steel or wood table. Three sizes, 24 in., 30 in., 36 in. Max. height of cut on 36-in. machines 19 in.; 400/440/3 phase supply. Illustration and prices from makers, F. J. Edwards, Ltd., 359 Euston Rd., London, N.W.1. Eus 4681. 219-1111

MACHINERY, TOOLS AND PLANT WANTED

INJECTION-MOULDING MACHINES required. Condition or size not important. Send details. Box P0814, care of "Plastics." 219-1138

REQUIRED IMMEDIATELY second-hand small-capacity vertical moulding machines, Asmidar or similar. Box P1932, care of "Plastics." 220-1162

T.M.A. INJECTION-MOULDING MACHINES required, 2-, 3-, 4-oz., mainly interested in 4-oz. machines of recent design and good condition essential. Details to Box P194, care of "Plastics." 221-1166

WANTED, hydraulic press, single daylight, approximate size of platen 10 ft. by 5 ft. Box P1926, care of "Plastics." 219-18

WANTED, reflector injection moulding tool, 1½ in. diameter, prism area, pencil type or electro formed, four or six cavities. Please send sample mouldings. Box P1912, care of "Plastics." 219-24

REQUIRED for experimental purposes, plastic extruder suitable for flexible and rigid P.V.C., about 1-in. diameter scroll and with electrically heated cylinder. Details to Kalamazoo, Ltd., Northfield, Birmingham. 219-4

MISCELLANEOUS

EXTEND YOUR TRADE.
Use a trade mark. Consult
Trade Mark Protection Society,
12 Church St., Liverpool. zzz-294

MOULDS

COMPRESSION MOULDS FOR SALE. Consist of household articles, fancy goods, smokers' sundries, toys and games, etc. Would make a very good range in particular for an overseas moulder. Write for full details. Box P186, care of "Plastics." 223-1161

PLASTIC DOYLEY MOULDS FOR SALE. Further particulars, apply Box P197, care of "Plastics." 219-A28

PRODUCTION CAPACITY

POLYSTYRENE AND CELLULOSE ACETATE INJECTION MOULDINGS up to 2 oz. Reliable service. Latest-type machines. Keen co-operation on new lines. W. H. Adamson Plastics, 39 Hedley St., Maidstone. 219-1132

INJECTION MOULDINGS AND PLASTIC COVERING IN ACETATE ALKATHENE, P.V.C., POLYSTYRENE AND DIAKON.

Machined Parts in Brass, Steel and Plastics.

We solicit your inquiries.

F. A. KETCH AND SON, LTD.,
TRENT VALLEY WORKS,
LICHFIELD, STAFFS.
Phone 3591 and 3592. zzz-500

KINGSTON PLASTICS, LTD., Unity Works, Union St., Kingston-on-Thames. Manufacturers of virgin and second-grade cellulose acetate moulding powders, matched to customer's own requirements for colour and flow. Customer's own waste also reprocessed to specified requirements. Sorting and grinding, incorporating magnetic separation of metallic particles of all thermoplastics undertaken. Phone, Kingston 8405. 219-1139

Production Capacity (contd.)

INJECTION MOULDINGS by I.O.G. Industries, Ltd., 41 Marshgate Lane, Stratford, E.15. Maryland 2804. 220-1094

VISIJAR LABORATORIES, LTD.,
THE LEADING CRAFTSMEN IN
" PERSPEX."
PROTOTYPE AND REPETITION.
OFFICIAL I.C.I. STOCKISTS " PERSPEX " SHEET, TUBE, ROD.
STOCKISTS AND FABRICATORS OF " FORMICA."
149 LONDON ROAD, CROYDON, SURREY.
Phone, Croydon 8228 (two lines). zzz-492

INJECTION MOULDINGS IN THERMOPLASTICS. Moulding in styrene, acrylics and acetate. Design and toolroom facilities available for mould construction. Inquiries invited. J. and E. Courtenay, Ltd., 138 Stratford Rd., Birmingham, 11. 220-1141

PLASTICS (MANCHESTER), LTD.,
BRITAIN'S LEADING STOCKISTS AND DISTRIBUTORS.
SPECIALISTS IN
FABRICATION, INJECTION MOULDING AND ENGRAVING.
11 WHITWORTH STREET,
MANCHESTER, 1.
Central 7081-2 and Central 1000. zzz-493

REPETITION in Ebonite, Erinoid, etc. Capstan lathe work. Temple St., Rugby. Phone 4059. 223-1118

DINES PRODUCTS, Whitehall Lane, Grays, Essex, for injection mouldings. 223-1120

ELCO PLASTICS, LTD.,
HIGH WYCOMBE,
BUCKS.
A.I.D. APPROVED.
MOULDERS, INJECTION COMPRESSION,
TRANSFER, SIDE RAM.
HIGH WYCOMBE 1921-2. zzz-498

SHORT RUNS A SPECIALITY LONG RUNS A PLEASURE. Low mould cost and overheads. Injection capacity and technical knowledge at your service. Westminster Plastics, Temple Works, 41 Old Church Rd., Chingford, E.4. Silverthorne 7927. 223-1121

COMPRESSION MOULDING CAPACITY available up to 150-ton presses, will accept sub-contracts; prompt deliveries at competitive prices. Write Box P151, care of " Plastics." 220-01138

TUBE LAMINATION AND ENGINEERING, LTD.,
HIGH WYCOMBE,
BUCKS.
MAKERS of S.R.B.P. TUBE " LAMTUF."
LIGHT ENGINEERS.
HIGH WYCOMBE 1921-2. zzz-499

CHIPPING OF PLASTICS AND GRINDING, screening, mixing and drying of all raw materials undertaken for the trade. Crack Pulverizing Mills, Ltd., Plantation House, London, E.C.3. Man 4405. zzz-487

P.V.C. SLUSH MOULDING AND DIPPING. D. R. Cheshire, Ltd., 43 Newington Causeway, S.E.1. Phone, Hop 1816. zzz-296

SMALL FACTORY, equipped with hand-injection machines, fly and power presses, etc., capacity available or suggestions for use invited. London area. Box P1811, care of " Plastics." zzz-301

CAPACITY AVAILABLE for manufacturing compression and injection moulds, together with jigs and general engineering, to customers' own designs, or, alternatively, designed by us. Inquiries for same will receive prompt attention. Elloid Engineering Co., Ltd., Goodacre St., Mansfield, Notts. Phone, Mansfield 2614. zzz-299

INJECTION MOULDING CAPACITY available up to 4 oz. Keenest quotations, prompt deliveries. Fully automatic plant. Islington Plastics, Ltd., 287 Liverpool Rd., London, N.1. Nor 4310. zzz-0501

Production Capacity (contd.)

HANDCOLOURING of plastic smallwares, also pearlizing promptly and efficiently undertaken. Proda (London), Ltd., 17 Bishops Bridge Rd., London, W.2. Amb 4043. 219-38

INJECTION-MOULD DESIGNER and product designer seeks commissions. Fully experienced any type of injection mould, quick, efficient, reliable service. Box P1934, care of " Plastics." 219-x7667

CASTINGS, negligible tool costs.
Phenolic resin castings (plated or coloured), maximum size 6 in. by 4 in. by 1 in.
Quick delivery, any quantity, inquiries invited.
Bashford Hill and Co., Ltd. Works behind 44 Gloucester Rd., Croydon. Phone, Tho 3428. 219-1174

PRODUCTION CAPACITY WANTED

LONDON MANUFACTURERS require compression moulding capacity for long runs on small components. First-class multi-impression moulds supplied by advertisers. State capacity available. Box P1913, care of " Plastics." 220-1167

PROGRESSIVE MANUFACTURERS seek further injection moulding capacity up to 8 oz., continuous work throughout the year, essential for assembly to be undertaken. Full details to Box P193, care of " Plastics." 221-1165

RAW MATERIAL

PERSPEX! PERSPEX!! PERSPEX!!! Official stockists for I.C.I. acrylic sheets. Sheets cut to your requirements. Fabrication and mounting specialists to the trade:—
S. C. Errington (Hanwell), Ltd., 132a Uxbridge Rd., Hanwell, London, W.7. Phone, Ealing 5288. zzz-40

ALWAYS LARGE STOCKS OF
CASEIN
RODS, TUBES AND SHEETS.
PERSPEX
SHEETS UP TO 1 IN. THICK.
CELLULOSE ACETATE
CATALIN RODS.
S.R. (PLASTICS), LTD.,
93 ALDERSGATE STREET, E.C.1.
Phone, Monarch 4686. 221-1103

LARGE QUANTITY of printed polythene film available, please contact. Box P1936, care of " Plastics." 219-47

AVAILABLE 20 tons black polythene granules, Reasonabe offer accepted. Box P1935, care of " Plastics." 219-46

PLASTICS (MANCHESTER), LIMITED,
BRITAIN'S LEADING STOCKISTS
OF
PERSPEX SHEET, ROD, TUBE.
11 WHITWORTH STREET,
MANCHESTER, 1.
Central 7081-2 and 1000. zzz-494

PERSPEX, Formica, Warerite, Traffolyte Eng., sheet. Specialists in cut sizes. Immediate delivery.
F. J. Bly and Co., Ltd., Empire Arcade, 370 Upper St., Angel, N.1. Can 5242-3. zzz-300

CUEX, LTD., can offer all at prices well below current list:—
Polystyrene.
Cellulose acetate.
Polyethylene.
P.V.C.
Polyvinyl butyral.
Perspex and Diakon.
Send now for details.
Cuex, Ltd., 270 Corporation St., Birmingham. Central 5474. 219-7

LARGE QUANTITY smoke cellulose acetate sheeting for disposal. New material in manufacturer's original packing. Of interest to manufacturers of sun glasses. Box P1925, care of " Plastics." 220-1172

EXTRUSIONS BY MARLEY
BUYERS REQUIRING RIGID AND FLEXIBLE
TUBES AND SECTIONS
IN
THERMOPLASTIC MATERIALS
SHOULD ASK FOR A QUOTATION FROM
MARLEY EXTRUSIONS, LTD.,
DEPT. 119
LENHAM.
MAIDSTONE, KENT.
HARRIETSHAM 381. 219-8

Raw Material (contd.)

BLACK POLYSTYRENE AND ACETATE, reprocessed moulding powder at 1s. 6d. lb. for sale. Herbert Connor, Ltd., 120 Beaufort Park, Falloden Way, London, N.W.11. 219-9

ACETATE SCRAP, several tons for disposal. Box P192, care of " Plastics." 219-10

CELLULOID AND ACETATE CLEAR AND WHITE UNIFORM OFFCUTS 10 and 15 thou. required. Normograph, 70 Princedale Rd., W.11. 221-1163

SMALL SURPLUS QUANTITY of colours. Vynamon red G.S. and brown B, and Monastral fast green G.S. powders in original packing. Advantageous prices. Box P199, care of " Plastics." 219-28

SURPLUS SILICONE RESINS. Approx. 35 lb. of R.220 and 5 lb. of S.C.50. Favourable prices. Box P198, care of " Plastics." 219-27

P.V.C. VIRGIN IVORY EXTRUSION MOULDING POWDER. Large quantity for disposal. Please write for particulars to Box P.1920, care of " Plastics." 219-12

P.V.C. SCRAP FOR SALE. Inquiries invited. Box P.1922, care of " Plastics." 219-13

RAW MATERIAL WANTED

WANTED, Polythene scrap. Write to Box P7416, care of " Plastics." zzz-0322

P.V.C. GARMENT AND HANDBAG OFFCUTS wanted. We collect and pay cash. Brockwell Plastics, Ltd., 50 Hollingbourne Rd., S.E.24. zzz-490

THERMOPLASTIC MATERIAL.
ANY QUANTITY URGENTLY REQUIRED.
MULTITEX, LTD.,
7-8 BULMER MEWS.
NOTTING HILL GATE,
LONDON, W.11.
Phone, Park 2611. 219-3

PROMPT CASH OFFERED for virgin and reprocessed cellulose acetate and polystyrene. Give manufacturers name and backing. Box P873, care of " Plastics." zzz-491

WANTED, large regular supplies of nylon scrap shaving. Hugh Kershaw, Oxenhope, Keighley. 220-1140

WE ARE INTERESTED in buying polystyrene scrap and virgin materials for cash. Box P1127, care of " Plastics." 223-1108

SURPLUS STOCKS of thermosetting and thermoplastic moulding powders wanted. Send details. Box P1727, care of " Plastics." zzz-297

SURPLUS OR REDUNDANT STOCKS WILL BE
PURCHASED FOR CASH,
ANY QUANTITY CONSIDERED.
SEND FULL DETAILS TO:—
LAWRENCE EDWARDS AND CO.,
23-25 KENSINGTON PARK ROAD,
LONDON, W.11.
Phone, Bayswater 4020. 220-1155

ERLANOS, LTD., 93 Aldersgate St., E.C. (Monarch 4686), require Perspex and cellulose offcuts and scrap, clear and coloured; highest prices paid. 229-1159

POLYTHENE SCRAP, natural, either film or sprues and runners in large quantities urgently required. Please offer with particulars to Herbert Connor, Ltd., 120 Beaufort Park, Falloden Way, London, N.W.11. 219-14

POLYSTYRENE SCRAP and surplus lots in quantities wanted. Please offer with particulars and samples to Herbert Connor, Ltd., 120 Beaufort Park, Falloden Way, London, N.W.11. 219-11

SITUATIONS VACANT

The engagement of persons answering advertisements in respect of vacant situations must be made through a local office of the Ministry of Labour, or a scheduled employment agency, if the applicant is a man between the ages of 18 and 64 inclusive or a woman between the ages of 18 and 59 inclusive, unless he or she, or the employment, is excepted from the provisions of Notification of Vacancies Order, 1952.

EXTRUSION-P.V.C. AND POLYTHENE CABLES. Charge-hand wanted with full technical knowledge, long experience and drive, small modern shop, good opportunity and conditions for really first-rate man. Write, stating age, qualifications, previous jobs, references, salary, to Box 507, Reynells', 44 Chancery Lane, London, W.C.2. zzz-298

DESIGN DRAUGHTSMEN. E. K. Cole, Ltd., Southend, have vacancies in their plastics division for mould design draughtsmen. Experience of injection, transfer and compression mould design essential. Write, stating age, qualifications and experience, to Personnel Manager. 220-23

Situations Vacant (contd.)

BRITISH THOMSON-HOUSTON CO., LTD., RUGBY.

Assistant chemists are required in the research laboratory at Rugby for development work involving the preparation and application on a laboratory scale of synthetic resins, varnishes and similar materials. The minimum qualification is a Higher National Certificate.

Applicants are invited to write to the Director of Research, British Thomson-Houston Co., Ltd., Rugby, stating age, qualifications and experience (if any), and quoting the reference SR.2. 220-1156

GODFREY HOLMES (PLASTICS), LTD., have a vacancy for tool designer/draughtsman. Experience in injection and compression moulds essential. Pleasant working conditions, pension fund, permanency.

Write in confidence to Managing Director, Godfrey Holmes (Plastics), Ltd., Wragby, Lincoln. 219-1160

FIRST-CLASS EXPERT for extrusion (polyvinylchloride and polyethylene) required for well-known corporation in Israel. Great experience essential. Write, giving full details experience, etc., to Box P191, care of " Plastics." 219-30

RADIO HEATERS, LTD., Wokingham, Berks, require general assistant to help in development of plastic sheet welding applications. Experience desirable but not essential in workshop practice and use of plastic materials. Good prospects and interesting varied work under excellent conditions.

Apply attention Manager, Plastic Welder Division. 219-31

ASSISTANT REQUIRED to sales manager of leading public company marketing plastic film, plastic packaging materials, plastic-coated fabrics, plastic extrusions, etc. The position will call for qualities of imagination, a high degree of initiative, and experience in the plastic field will be an advantage. The situation is superannuated and salary will be commensurate with experience.

Please apply in writing, giving full details of past experience and salary required, to Sales Manager, Greenwich Plastics, Ltd., St. Mary Cray, Kent. 219-32

MANUFACTURER of mass-produced soft plastic fancy goods requires experienced guillotine cutter. Clissold 3057. 219-33

FRANCIS SHAW AND CO., LTD., require the services of a sales and development engineer who must have sound knowledge of the rubber and plastics industries, particularly in the mixing, calendering and extrusion fields. A.M.I.Mech.E. standard or equivalent. Age 25 to 30. Good salary and prospects.

Write to Personnel Manager, Francis Shaw and Co., Ltd., Corbett St., Manchester, 11. 219-34

HAWKER AIRCRAFT, LTD.,

REQUIRE

A DEVELOPMENT ENGINEER

FOR RESEARCH INTO USE OF

PLASTICS

FOR AIRCRAFT COMPONENTS AND TOOLS.

APPLICANTS SHOULD POSSESS A UNIVERSITY DEGREE, PREFERABLY IN CHEMICAL ENGINEERING AND EXPERIENCE IN PLASTIC INDUSTRY WOULD BE AN ADVANTAGE.

APPLICATIONS GIVING FULL DETAILS OF QUALIFICATIONS AND EXPERIENCE TO:—

THE PERSONNEL SUPERVISOR,
HAWKER AIRCRAFT, LTD.,
CANBURY PARK ROAD,
KINGSTON-ON-THAMES. 219-42

QUALIFIED TECHNICAL LEADER of factory of extruding polyethylene film and bagmaking, with and without printing, is wanted for minimum one year.

Troester extruding machines. Beasley and French printing machine. Roto-Bag sealing machine. Production starts November-December this year.

Applications to Harald Lyche and Co., Drammen, Norway. 219-35

CHEMISTS AND PHYSICISTS, B.X. Plastics, Ltd., Brantham Works, near Manningtree, Essex, have vacancies for chemists and physicists. Candidates should hold degrees or similar qualifications but, alternatively, exceptionally good experience in the thermoplastic industry would be considered. The work is concerned in the main with technical service to the factory and to customers. Salary commensurate with experience and qualifications.

Apply, giving full details of qualifications and career to date, to the Personnel Manager at Brantham Works. 219-36

Situations Vacant (contd.)

QUALIFIED CHEMIST, age 24-30, required by The Bristol Aeroplane Co., Ltd., for development and process control work in applications of synthetic resins and adhesives. Previous practical experience is essential.

Applications in writing, giving fullest details and quoting AIR.27 should be addressed to the Personnel Manager, Aircraft Division, Filton House, Bristol. 219-43

ASSISTANT FOREMAN required for injection moulding shop with experience of tool setting and machine maintenance. Write, Box P1933, care of " Plastics." 219-45

PLASTICS CHEMIST/TECHNOLOGIST required by well-established company, to work on new and interesting developments.

Applicants should hold at least a B.Sc. general degree, have completed their National Service and not be more than 25 years of age. Please write, giving full particulars, to Box P1930, care of " Plastics." 220-1173

ANALYTICAL CHEMIST (JUNIOR) is required to investigate properties of compounds based on rubber and plastics. Experience in this field is desirable although not essential. There is scope for original work and a varied field of activity, very good working conditions, prospects of promotion excellent, salary dependant on qualification and experience. Reply to Box P1921, care of " Plastics." 220-1171

A PHYSICIST, preferably recently qualified, is required to study the properties of reinforced plastics. Opportunity for fundamental work in an interesting new branch of the plastics industry. Location N.W. London. Very good working conditions, prospects of promotion excellent, salary dependant on qualification and experience. Reply to Box P1917, care of " Plastics." 220-1170

AN EXCEPTIONAL OPENING is available for a chemist required for interesting work on the development and use of cross-linking liquid polymers. Previous experience in this or allied fields is an advantage, but is secondary to intelligence, initiative, keenness and ability to work with others. The laboratories are in N.W. London, but the applicant must be prepared to travel and to work for certain period in other parts of the U.K. and possibly overseas. Very good working conditions, prospects of promotion excellent. Salary dependant on qualification and experience. Reply to Box 1916, care of " Plastics." 220-1169

TECHNICAL REPRESENTATIVE with good connection and experience in the plastics and rubber moulding and extruding trade, progressive, pensionable post available to suitable applicant. Finney Presses, Ltd., Berkley St., Birmingham, 1. 219-39

TURNER BROTHERS ASBESTOS CO., LTD., Hindley Green, near Wigan, require a technical assistant to the manager of a plastics production department. This is an excellent opportunity for a keen man to join an expanding organization and to establish a small section responsible for supervising process control and inspection of products manufactured from high- and low-pressure moulded thermosetting materials.

Applicants, not exceeding 28 years of age, should preferably be Associates of the Plastics Institute or alternatively have an engineering qualification with experience in a similar branch of the plastics industry. A knowledge of statistical quality control would be an advantage. Salary according to age, experience and qualifications.

Apply in first instance, in writing, to Personnel Officer, giving details of age, education and experience. 219-41

A DEVELOPMENT CHEMIST is required for interesting work on new compounding methods and application for products based on either natural rubber or synthetic polymers. Experience in this field is very desirable. Very good working conditions, prospects of promotion excellent. Salary dependent on qualification and experience. Reply to Box P1915, care of " Plastics." 220-1168

ASSISTANT ENGINEER, age up to 35, is required by British Cellophane, Ltd., Bridgwater, Somerset. Applicants should have an honours degree in Mechanical Engineering and have had some practical design and works experience. The duties will be on development, improvement and maintenance of plastic films extrusion plant and ancillary equipment. Write to the Personnel Officer, stating full particulars and salary required and quote Ref. No. E34. P. 220-1164

DRAUGHTSMAN required for the design of plastic mouldings. Must have sound knowledge of compression and injection methods and experience with development of new products. Write, giving full details of experience and salary required. Box P196, care of " Plastics." 219-x7581

LONDON RUBBER MANUFACTURERS require junior and senior technologists in their works laboratory for routine control and extensive development work. Details of experience, qualifications and salary required to Box P1918, care of " Plastics." 219-22

EXPANDING COMPANY engaged in the manufacture of various plastic and rubber commodities requires the services of a development officer. Applicants must have had sound technical experience in both rubber and plastic production. Non-contributory pension scheme in operation. All staff have been advised. Box P1914, care of " Plastics." 219-23

Situations Vacant (contd.)

AN EXPERIENCED MAN is required in London to handle the commercial aspects of light chemicals and plastics manufacture. Technical background advantageous but not essential.

Applicants should be aged 35/45 with at least 10 years' specialist experience in this field, and be conversant with current practice. Salary up to £4,000 per annum, depending on qualifications and experience. Attractive pension scheme.

All applications will be dealt with in strict confidence. This post provides an exceptional opportunity for the right man.

Write, giving full particulars of qualifications and experience, to Box P1931, care of " Plastics." 219-6

SALESMAN for plastic raw material manufacturers. An excellent chance for a keen young man with experience of the injection moulding industry to join an expanding sales organization in London. Pensionable staff position. State salary required. Box P1924, care of " Plastics." 219-19

ASSISTANT TECHNICAL MANAGER. Good opportunity exists for a practical man to assist technical manager of well-established injection moulding company. Will be required to design and follow through moulds from drawing board to moulding stage.

Applications will only be considered from persons with previous practical experience.

Write in confidence, giving full particulars and salary required, to Box P1919, care of " Plastics." 219-21

TOOL ROOM SUPERINTENDENT. A vacancy exists for fully qualified and competent engineer, age 30/40 to take complete charge of small but well-equipped tool room and drawing office in Glasgow area. Five-day week, must be good supervisor, capable of tool design and tool progress, and have ability to interview customers. Knowledge of plastics industry an asset. Top salary for right person. Full details, age, education, qualifications, present salary and experience to Box P1911, care of " Plastics." 219-25

AN EXCELLENT OPPORTUNITY has arisen for a chemist for the plastics division of a large North of England manufacturing company. The duties will include responsibility for development and supervision of the physical and chemical testing of raw materials and research work on formulations and operating methods. Applicants should, therefore, have good experience in plastics industry, particularly thermoplastics, compounding, extrusion and injection moulding, and a B.Sc. or A.R.I.C. is desirable.

The starting salary will take into account previous experience and qualifications, and there is opportunity for development with a rapidly expanding activity.

Assistance with housing will be given if necessary.

Applications, including full details of career to date, qualifications and present salary, marked " Confidential (Plastics)," to Box P1910, care of " Plastics." 219-26

COMPANY SITUATED IN MIDLANDS requires the services of a suitably qualified engineer for its development department in connection with a new component for automobile suspension about to be produced. Box P195, care of " Plastics." 219-29

WITH THE COMPLETION of their new research and development centre, Rubber Improvement, Ltd., Wellingborough, require the services of the following personnel for this department which is housed in new premises with modern equipment of the latest design:—

1. Rubber chemist/technologists, preferably L.I.R.I. or A.I.R.I.
2. P.V.C. technologists, preferably A.P.I.
3. Development engineers with experience in either the rubber or plastics industries.

Non-contributory life assurance and pension scheme in operation. Apply to the Secretary, Rubber Improvement, Ltd., Wellingborough, Northants. 219-2

SITUATIONS WANTED

WORKS MANAGER, age 47, first-class injection moulding knowledge from tools to packing. Tradeshop and American factory experience, seeks change. Box P1937, care of " Plastics." 219-xB8496

DIE-SINKER requires position with plastic company. Recently returned from five years in U.S.A. with leading plastic hobby kit and model manufacturers; south preferred. Box P1928, care of " Plastics." 219-x8634

TIME RECORDERS

FACTORY TIME RECORDERS. Service rental. Phone, Hop 2230. Time Recorder Supply and Maintenance Co., Ltd., 157-158 Borough High St., S.E.1. 221-1102

BOOKS AND PUBLICATIONS

THE THEORY OF POLYMERIZATION, by H. R. Fleck, M.Sc., F.R.I.C. Full examination in simple language with examples, calculations and exercises of this fundamental aspect of the chemistry of plastics. Illustrated, 144 pages, 10s. 6d. net from booksellers, or 11s. by post from the publishers, Temple Press Ltd., Bowling Green Lane, London, E.C.1. zzz

PLASTICS, SCIENTIFIC AND TECHNOLOGICAL (3rd edition), by H. R. Fleck, M.Sc., F.R.I.C. A completely revised edition of a recognized standard work on the chemistry and technology of plastics. ". . . should be in every technical library."—Times Review of Industry. Illustrated, 400 pages, 40s. net from booksellers, or 40s. 9d. by post from the publishers, Temple Press Ltd., Bowling Green Lane, London, E.C.1. zzz

Phoenix Rubber Company Limited

91 Bishopsgate, London, E.C.2
London Wall 1622

★ ★ ★ ★

Works : **2K Buckingham Avenue, Slough Trading Estate, Slough, Bucks.**
Slough 22307/8/9

PLASTIC COMPOUNDS and SHEETINGS
PUNCH and PRESS BOARDS

Phenco Flooring in Tiles and Sheet

CONVERSION, COMPOUNDING and CALENDERING of
CUSTOMERS' PLASTIC SCRAP

INDEX TO ADVERTISERS

Name	Page
A	
Adamson Plastics, W. H., Ltd.	100
Aeraspray Associated, Ltd.	99
Aldersley Agencies, Ltd.	63
Arpal (Engineers), Ltd.	83
Asmidar Plastic Moulding Machines, Ltd.	85
Associated Lead Manufacturers, Ltd.	86
B	
Bakelite, Ltd.	10, 56
Barber & Duffy, Ltd.	92
Beck Koller & Co. (England), Ltd.	16
Beecham Buildings, Ltd.	8, 9
B.I.P. Chemicals, Ltd.	35
B.I.P. Engineering, Ltd.	54
B.I.P. Tools, Ltd.	32
Birkbys, Ltd.	29
Blagden, Victor, & Co.	74
Blackfriars Rotary Cutters, Ltd.	99
B.L.C. (Exports), Ltd.	98
Boake, A., & Roberts Co., Ltd.	43
Bradley & Turton, Ltd.	4
Brand, Ed., Ltd.	51
Bridge, David, & Co., Ltd.	7
British Celanese, Ltd.	12
British Electrical Development Association, The	20
British Geon, Ltd.	44
British Oxygen Co., Ltd., The	47, 61
BX Plastics, Ltd.	Inside Front Cover
Byson Appliance Co., Ltd.	98
C	
Calderon, M., Ltd.	96
Case Development Co., Ltd.	93
Castle, John, & Co., Ltd.	92
Catalin Ltd.	69
Cellgrave Co., Ltd.	82
Chamberlain & Willows	96
Cohen, George, Sons & Co., Ltd.	97
Cole, R. H., & Co., Ltd.	13
Compoflex Co., Ltd.	79
Courtaulds, Ltd.	Front Cover
Coventry Motor & Sundries Co., Ltd.	31
Crystalate, Ltd.	75
D	
Dale, John, Ltd.	64
Darwins, Ltd.	21
Dexion, Ltd.	18, 19
Distrene, Ltd.	50
Dixon, Arthur, & Co., Ltd.	98
E	
East Anglia Plastics, Ltd.	39
Edwards High Vacuum, Ltd.	91
Elliott, E., Ltd.	46
Ellison, George, Ltd.	100
Elm Plastics, Ltd.	88
E.M.B. Co., Ltd.	22
E.M.I. Electronics, Ltd.	88
Empire Plastics (Birmingham), Ltd.	94
Erinoid, Ltd.	33, Back Cover
Ether, Ltd.	95
Evans, Frederick W., Ltd.	98
F	
Ferguson, James, & Sons, Ltd.	40, 83
Fibreglass, Ltd.	30
Finney Presses, Ltd.	86
Firth, Thos. & J. Brown, Co., Ltd.	11
Fraser & Glass, Ltd.	55
G	
Gardner, Wm. & Sons, Ltd., Gloucester	48
Geigy Co., Ltd., The	59
General Electric Co , Ltd., The	23
Genristo, Ltd.	78
Glass Yarns & Deeside Fabrics, Ltd.	81
Greenwich Plastics, Ltd.	24
Griffiths, Gilbart, Lloyd & Co., Ltd.	80
Grist Plastics	49
H	
Haigh, John, & Co., Ltd.	88
Harris Plastics (Richmond), Ltd.	87
Harvey, G. A., & Co. (London), Ltd.	81
Hellermann, Ltd.	87
Herbert, Alfred, Ltd.	17
Hercules Powder Cc., Ltd.	70
High Pressure Components, Ltd.	89
Hobart Manufacturing Co., Ltd., The	89
Holliday, L. B., & Co., Ltd.	98
Hornflowa, Ltd.	65
I	
Imperial Chemical Industries, Ltd., Plastics Division	38, 60, Inside Back Cover
Industrial Plastics, Ltd.	28
Injection Moulders, Ltd.	71
Insulation Equipments, Ltd.	52
K	
Kent Mouldings	84
Kimbell, John, & Co., Ltd.	41
Kleestron, Ltd	53
L	
London & Scandinavian Metallurgical Co., Ltd.	72
Ly-Bak, Ltd.	96
M	
Marshall, C. & C., Ltd.	94
Martin, T. G., & Co.	98
May & Baker, Ltd.	14
Melwood Thermoplastics, Ltd.	85
Micanite & Insulators Co., Ltd., The	15
Microcell, Ltd.	91
Miltoid, Ltd.	74
Monsanto Chemicals, Ltd.	36, 37
N	
National Plastics (Sales), Ltd.	58
O	
Oakley, H. G., & Co., Ltd.	94
P	
P.A.M., Ltd.	90
Pascall Engineering Co., Ltd., The	99
Phoenix Rubber Co., Ltd.	104
Plant Installations, Ltd.	68
Plastic Engineers, Ltd.	95
Punfield & Barstow (Mouldings), Ltd.	66
Pure Chemicals, Ltd.	76
R	
Radio Heaters, Ltd.	92
Redifon, Ltd.	72
Reliance Trading Co.	96
Resinoid & Mica Products, Ltd.	90
Rubber Improvements, Ltd.	67
S	
Sale, H. B., Ltd.	76
Shaw, Francis, & Co., Ltd.	3
Short Bros. & Harland, Ltd.	100
S.I.C. Plastics, Ltd.	5
Simmonds Aerocessories, Ltd.	42
Simon, Henry, Ltd.	73
Souplex, Ltd.	96
Spicers, Ltd.	92
Spooner Dryer & Engineering Co., Ltd., The	77
Steele & Cowlishaw, Ltd.	93
Sterling Moulding Materials, Ltd.	6
Stevens, Michael S.	100
Streetly Manufacturing Co., Ltd., The	25
Sturge, John, E., Ltd.	84
Styrene Products, Ltd.	33
Synthite, Ltd.	2
T	
Textile Paper Tube Co., Ltd., The	80
U	
U.K. Plastics, Ltd.	96
United Coke & Chemicals Co.	62
United Ebonite & Lorival, Ltd.	34
Universal Metal Products, Ltd.	27
Utilex, Ltd.	94
V	
Vulcan Boiler & General Insurance Co., Ltd., The	78
W	
Westbury Engineering Co., Ltd.	82
Wickman, Ltd.	1
Wiggins, Teape & Alex Pirie (Sales) Ltd.	26
Whiffen & Sons, Ltd.	45
Wm. Williamson & Sons (Kirkcaldy), Ltd.	100
Y	
Yorkshire Copper Works, Ltd., The	97

Printed in England and Published Monthly by the Proprietors, TEMPLE PRESS LTD., BOWLING GREEN LANE, LONDON, E.C.1.
Annual subscription rate 34/- (Canada and U.S.A. $5.50). Shorter periods pro rata. Registered for transmission to Canada and Newfoundland by magazine post. AGENTS ABROAD—EUROPE—Messageries Dawson (S.A.), Paris; Messageries Hachette et Cie, Paris; W. H. Smith & Son, Paris and Brussels. U.S.A.—International News Co., New York. CANADA—Wm. Dawson Subscription Service Ltd., Toronto; Gordon & Gotch, Ltd., Toronto. AFRICA—Central News Agency, Ltd., Cape Town; W. Dawson & Son (S.A.), Cape Town. ASIA—W. Thacker & Co., Ltd., P.O. 190, Bombay. AUSTRALIA and NEW ZEALAND—Gordon & Gotch (A'sia) Ltd.

Easy-to-mould 'Alkathene'

'Alkathene' brand of polythene is very easy to mould into intricate, hygienic, tough and gaily coloured children's toys . . . toys that are light in weight, *will not shatter* and being pliable, cannot hurt children if they fall on them.

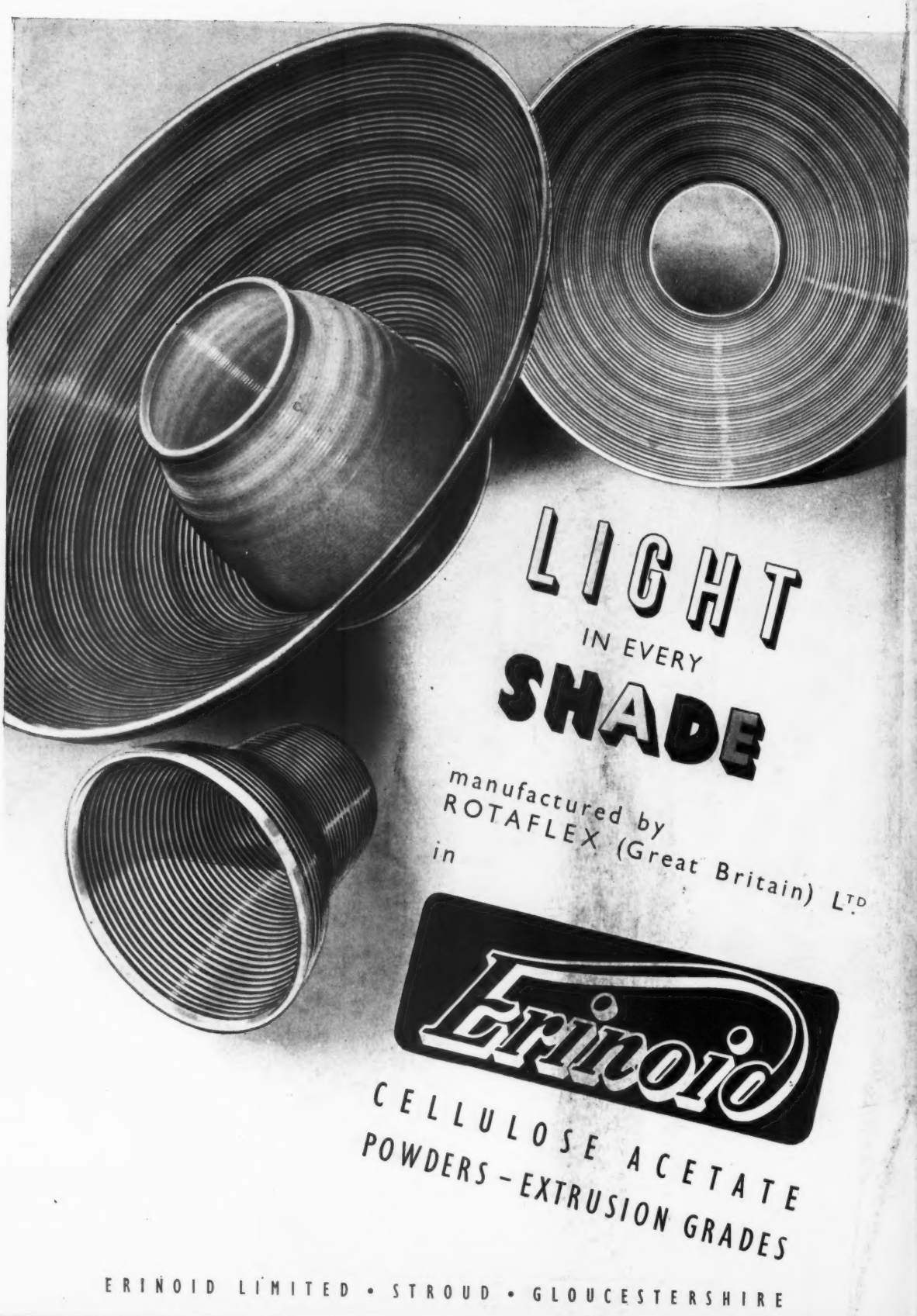
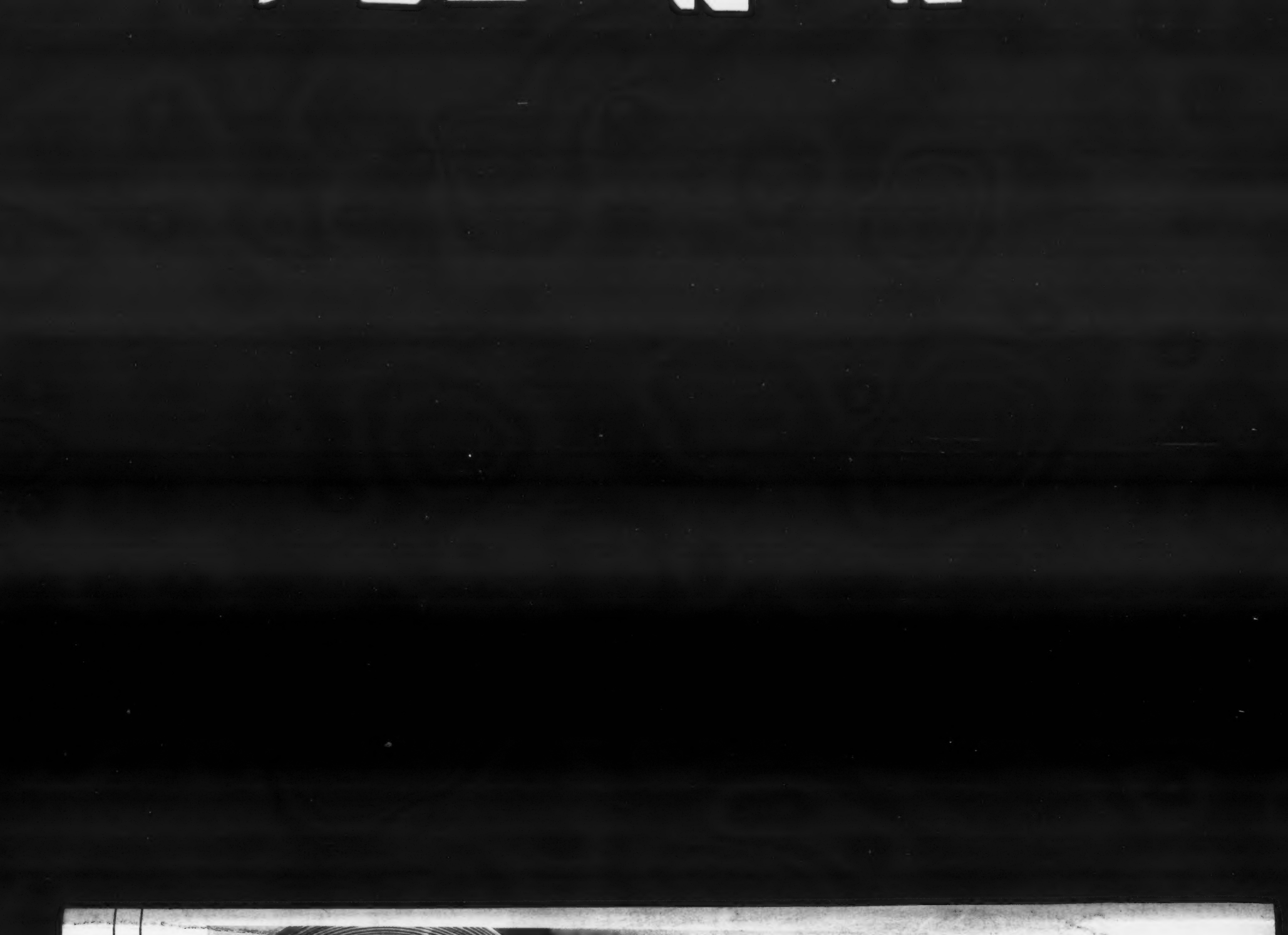
Polythene has the lowest specific gravity of any plastic in the world and it is now one of the most economical.

Polythene was discovered, developed, and is sold under the trade mark 'Alkathene,' by

IMPERIAL CHEMICAL INDUSTRIES LIMITED, LONDON, S.W.1

P.595

Vol. XX. No. 219

Plastics

OCTOBER, 1955